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POLYCHÆTA

BY

C. C. A. MONRO, M.A.
(*Assistant Keeper in the Department of Zoology*)

WITH TWENTY-EIGHT TEXT-FIGURES

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INTRODUCTION

The present collection was obtained in the Red Sea and the Arabian Sea, in the Gulfs of Aden and Oman, off the South Arabian Coast, and in the Zanzibar and Maldive areas. Except for a few nereids taken on the shore of the South Arabian Coast, there was no littoral collection made, but all the material was obtained from coastal or deep-water positions.

There follows a list of species :

Family Amphinomidæ.

Euphrosyne foliosa Audouin and Milne-Edwards.
Benthoscolex cæcus Horst.
Notopygos sp.
Pseudeurythoë acarunculata n. sp.
P. ambigua (Monro).
Eurythoë complanata (Pallas).
Chloeia tumida Baird.
C. fusca McIntosh.
C. violacea Horst.

Family Aphroditidæ.

Lætmatonice producta Grube var. *benthaliana* McIntosh.
Aphrodite talpa Quatrefages.
Hermione hystrix (Savigny).
Aphrogenia alba Kinberg.

Family Polynoidæ.

Harmothoë cornuta (Potts).
H. arabica n. sp.
H. lunulata (Delle Chiaje).
Hololepidella commensalis Willey.
Eunoë pallida (Ehlers).
Allmaniella sp.
Nectochæta caroli Fauvel.
N. grimaldii Marenzeller.

Family Sigalionidæ.

Sigalion mathildæ Audouin and Milne-Edwards.
Leanira vulturis Horst.
L. japonica McIntosh.
Euthalanessa djiboutiensis (Gravier).

Family Polyodontidæ.

Polyodontes melanonotus (Grube).
Polyodontes sp.
Panthalis ærstedi Kinberg.

Family Chrysopetalidæ.

Chrysopetalum occidentale H. P. Johnson.

Family Phyllodocidæ.

Phyllodoce madeirensis Langerhans.
Notophyllum splendens (Schmarda).
Eulalia tenax Grube.
Lopadorhynchus uncinatus Fauvel.
L. brevis Grube.
L. brevis Grube var. **nuchalis** var. nov.

Family Alciopidæ.

Rhynchonerella fulgens Greeff.
Vanadis formosa Claparède.

Family Tomopteridæ.

Tomopteris (*Johnstonella*) *dunckeri* Rosa.
T. (*Johnstonella*) *duccii* Rosa.
T. cavallii Rosa.
T. planktonis Apstein.

Family Hesionidæ.

Hesione intertexta Grube.

Family Syllidæ.

Syllis variegata Grube.
S. gracilis Grube.
S. krohnii Ehlers.
S. brachychæta Schmarda.
S. curticirris n. sp.
Syllis sp.
S. (*Haplosyllis*) *spongicola* Grube.
S. (*Ehlersia*) *cornuta* Rathke.
Trypanosyllis zebra Grube.
Parasphærosyllis indica gen. et sp. nov.

Family Nereidæ.

Nereis jacksoni Kinberg.
N. zonata Malmgren var. *persica* Fauvel.
N. longilingulis n. sp.
Platynereis pulchella Gravier.
Ceratonereis mirabilis Kinberg.
Leonnates jousseaumei Gravier.

Family Nephthydidæ.

Nephthys dibranchis Grube.
N. inermis Ehlers.

Family Glyceridæ.

Glycera rouxii Audouin and Milne-Edwards.
G. subœnea Grube.
G. lancadivæ Schmarda.
Goniada multidentata Arwidsson var. **indica** var. nov.
G. eximia Ehlers.
G. longicirrata Arwidsson.

Family Eunicidæ.

Eunice indica Kinberg.
E. australis Quatrefages.
E. antennata Savigny.
E. tentaculata Quatrefages.
E. validobranchiata n. sp.
E. investigatoris Fauvel.
Marphysa simplex Crossland.
Lysidice collaris Grube.
Onuphis furcatoseta n. sp.
O. aucklandensis Augener.
O. eremita Audouin and Milne-Edwards.
Onuphis sp.
Diopatra neapolitana Delle Chiaje.
Hyalinœcia tubicola (O. F. Müller).
Rhamphobrachium bipes n. sp.
R. diversosetosum n. sp.
Lumbrinereis latreilli Audouin and Milne-Edwards.
L. impatiens Claparède.
L. heteropoda Marenzeller.
L. quasibifilaris n. sp.
Drilonereis filum Claparède.

Family Spionidæ.

Prionospio pinnata Ehlers.

Family Magelonidæ.

Magelona sp.

Family Chætopteridæ.

Phyllochætopterus sp.

Family Cirratulidæ.

Cirratulus sp.
Chætozone setosa Malmgren.

Family Chlorhæmidæ.

Stylarioides xanthotrichus (Schmarda).
S. hamocarens n. sp.
Brada villosa (Rathke).
Flabelligera diplochaitos (Otto).
Ilyphagus hirsutus n. sp.

Family Capitellidæ.

Notomastus latericeus Sars.
Dasybranchus caducus Grube.

Family Maldanidæ.

Maldane cristata Treadwell.
M. sarsi Malmgren var. **tropica** var. nov.
Notoproctus pacificus (Moore).
Clymene (*Praxillella*) *gracilis* (Sars).
Clymene sp.
Clymenella sp.
Nicomache sp.
Petaloproctus cirratus n. sp.

Family Oweniidæ.

Owenia fusiformis Delle Chiaje.

Family Sabellariidæ.

Sabellaria spinulosa Leuckart.
S. spinulosa Leuckart var. *alcocki* Gravier.

Family Ampharetidæ.

Amphicteis gunneri Sars.

Family Terebellidæ.

Thelepus comatus (Grube).
Nicolea gracilibranchis (Grube).
Polymnia nebulosa (Montagu).
Loimia medusa Savigny.
Pista herpini Fauvel.
P. typha (Grube).
P. robustiseta Caullery.

Family Sabellidæ.

Demonax leucaspis Kinberg.
Dasychone cingulata Grube.
Branchiomma mushaensis Gravier.
Euratella puncturata (Augener).

Family Serpulidæ.

Serpula vermicularis L.
Hydroides exaltata (Marenzeller) var. *vesiculosa* Fauvel.
H. homoceros Pixell.
Spirobranchus giganteus Pallas.
S. giganteus var. **arabica** var. nov.
S. maldivensis Pixell.
Vermiliopsis glandigera Gravier.
V. acanthophora Augener.
V. multicristata (Philippi).
Placostegus tridentatus (Fabricius).
Ditrupa arietina (O. F. Müller).

The total number of species or varieties is 133, belonging to 83 genera. The proportion of new forms is high, for there are 1 new genus, 13 new species and 4 new varieties, and this is probably to be explained by the fact that much of the material was obtained from very considerable depths.

Fauvel has recently (1932) published under the title of " The Annelida Polychæta of the Indian Museum " a comprehensive paper on the Indian Ocean Polychæta, in which he gives a diagnosis, with ample citations and lists of synonyms, of every species represented. He also provides a full list of the literature of the Indian Ocean Polychæta. A large proportion of the species in the present collection is to be found in Fauvel's Indian Museum material, and to obviate reduplication I have simply given the reference to Fauvel's paper when the same species is present in both collections.

Apart from new forms, the following species were not represented in the Indian Museum collection :

Pseudeurythoë ambigua.
Chlœia tumida.
C. violacea.
Harmothoë cornuta.
H. lunulata.
Nectochæta caroli.
N. grimaldii.
Leanira vulturis.
Sigalion mathildæ.
Chrysopetalum occidentale.
Notophyllum splendens.
Lopadorhynchus brevis.
Rhynchonerella fulgens.
Vanadis formosa.
Tomopteris (*Johnstonella*) *dunckeri.*
T. (*J.*) *duccii.*
T. cavallii.
T. planktonis.
*Syllis krohnii.**
S. (*Ehlersia*) *cornuta.**
Platynereis pulchella.
Nephthys inermis.
Glycera subœnea.
Goniada eximia.
G. longicirrata.
Marphysa simplex.
Chætozone setosa.
Stylarioides xanthotrichus.
Brada villosa.
Flabelligera diplochaitos.
Maldane cristata.
Notoproctus pacificus.
Thelepus comatus.
Demonax leucaspis.
Branchiomma mushaensis.
Euratella puncturata.
Hydroides exaltata var. *vesiculosa.*
H. homoceros.
*Vermiliopsis glandigera.**
*V. acanthophora.**
V. multicristata.
Placostegus tridentatus.

The Amphinomids are represented by nine species, among which there is a small eyeless *Notopygos* from a depth of over 1200 m., a new species devoid of a caruncle of Fauvel's recent genus *Pseudeurythoë*, and a representative of *Pseudeurythoë ambigua* previously known only from the Panama region. The Polynoids yielded several deep-water examples, one of which I have attributed to *Harmothoë cornuta* and another to *Allmaniella* ; there is a new *Harmothoë* with smooth dorsal and upper ventral bristles, and two pelagic members of the family are represented, *Nectochæta caroli* and *N. grimaldii*. Among the Polyodontids there is a young *Polyodontes* which appears to combine the characters of *P. melanonotus* and *P. maxillosus*. The single Chrysopetalid agrees with Johnson's *Ch. occidentale* from the Californian coast, which is probably the same as the

* Those marked with an asterisk are represented in Fauvel's (1930) ' Littoral Fauna of Krusadai Island, Gulf of Manaar '.

European *Ch. debile* Grube. Among the Phyllodocids Grube's pelagic Mediterranean *Lopadorhynchus brevis* is represented, and also a *Lopadorhynchus* with very conspicuous nuchal organs.

There are four species of Tomopterids, among which is *Tomopteris* (*Johnstonella*) *duccii*, remarkable for having three distinct kinds of pedal glands and a sting.

There are two new species and one new genus of Syllids, the new genus being distinguished by having over part of the body slender, moniliform dorsal cirri alternating with smooth, swollen dorsal cirri; the new species has dorsal cirri with only three to four articles.

Among the Nereids the new *N. longilingulis* has extraordinarily long, cirriform pedal languets, and I am able to relate a curious heteronereid showing the *polyscalma* type of modification to *Platynereis pulchella*.

There are five species of Glycerids, and among them there is an example from a depth of over 1519 m. of the Magellan, cold-water *Goniada eximia*. The Eunicids are represented by 21 species, among which the new deep-water *Eunice validobranchiata* has an extraordinary development of gill. Fauvel's recent *E. investigatoris* was also obtained from a depth of over 1000 m. There is a new deep-water *Onuphis* with ramified woolly gills and curious, forked, anterior hooks. There are two new species of the rare *Rhamphobrachium*, one of which has only the first two feet modified, and a new *Lumbrinereis* with long, paired, cirriform pedal ligules and compound anterior hooks.

The Magelonids are represented by a pelagic post-larva, and among the Cirratulids there is an example of the northern European *Chætozone setosa* not previously recorded from tropical waters.

The Chlorhæmids have five species, among which is a new *Stylarioides* entirely devoid of hooks and an example of the rare deep-water genus, *Ilyphagus*.

The Maldanids include specimens of Treadwell's Californian *Maldane cristata* and Moore's *Notoproctus pacificus*, previously known from the neighbourhood of Vancouver Island, a new variety from below the 1000 m. line of *Maldane sarsi*, and a new *Petaloproctus* with a cirrigerous anal plate. Among the Terebellids is an example of *Thelepus comatus* previously known from Chile and the Panama region. The Sabellids include examples of the curious *Euratella puncturata* known from the West African coast, and among the Serpulids there are a new variety of *Spirobranchus giganteus* with small chitinous hooks on the operculum, and an example of the European *Placostegus tridentatus*.

Fauvel has already called attention to the number of species common to the Indian Ocean and to the Atlantic and Mediterranean, and has often emphasized the fact that many Polychætes have a cosmopolitan distribution.

It is perhaps worth calling attention to the great variety of species obtained at two stations, St. 45, South Arabian Coast, depth 38 m., bottom lithothamnion, and St. 53, South Arabian Coast, depth 13·5 m., bottom rock, shingle, shells and lithothamnion. Examples of no less than 38 species were taken at one or both of these two stations.

SYSTEMATIC ACCOUNT

Family Amphinomidæ.

Genus *Euphrosyne* Savigny.

Euphrosyne foliosa Audouin and Milne-Edwards.

Fauvel, 1923, p. 136, fig. 49 *a–g*, and 1932, p. 59, with synonymy.

Occurrence :

St. M.B. Id, Red Sea, 26 m. (1).

St. 10, Red Sea, 55 m. (1).

Distribution.—Atlantic, Mediterranean, Indian Ocean.

Remarks.—The tips of the gills are expanded. The specimen from St. 10 has a pale yellow body colour and wine-red gills and caruncle. The other specimen has the usual greyish colour in spirit. Fauvel has identified this European species with the *E. laureata* Savigny of Horst, Pruvot and Gustafson.

Genus *Benthoscolex* Horst.

Benthoscolex cœcus Horst.

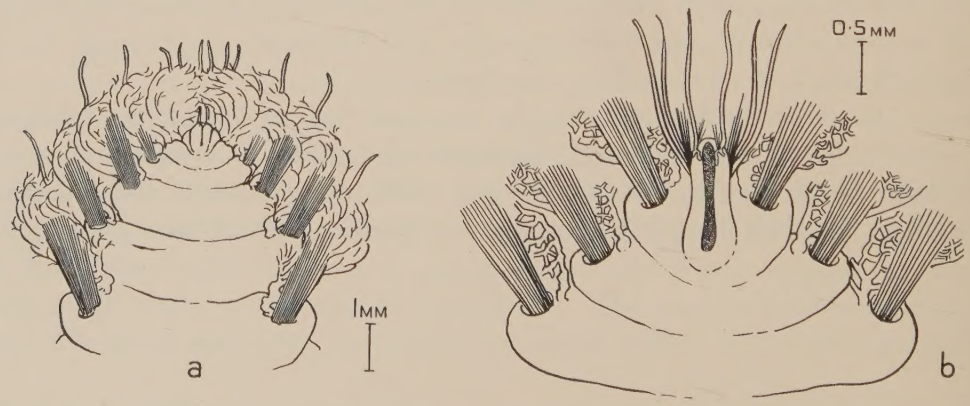
Horst, 1912, p. 38, pl. x, figs. 11–16.
Fauvel, 1932, p. 54.

Occurrence :

St. 177, Gulf of Aden, 274–366 m. (9).

Distribution.—Flores Sea, Ceylon, Indian Ocean.

Remarks.—The largest specimen measures 40 mm. by 7 mm. at the widest part without the feet for 31 chætigers. Except in one or two details they agree with Horst's account. The gills begin with a minute bifurcate filament on the 5th chætiger. Horst states that there is an unpaired anal cirrus. This I have not seen. The anus consists of a subterminal, dorsally truncated cleft extending over the last 3 or 4 chætigers. It is hidden by the greatly developed clusters of gills (Text-fig. 1*a*), and the terminal segments which it occupies are very crowded and difficult to count.



Text-fig. 1.—*Benthoscolex cœcus* Horst. *a*, Terminal segments from above. *b*, Anal segments from above. Gill removed from penultimate segment.

The body appears to end with a pair of modified parapodia fused with the ventral lip of the anus (Text-fig. 1*b*). These parapodia each consist of a rudimentary branched gill, a single very small bristle-bundle and a very long ventral cirrus. I can see no unpaired anal cirrus, nor can I follow Horst when he speaks of "an unpaired anal papilla, faintly emarginated".

Genus *Notopygos* Grube.

Notopygos sp. juv.

Occurrence :

St. 119, Zanzibar, 1207–1463 m. (1).

Remarks.—This small specimen from below the 1000 m. line measures 9 mm. by 3 mm. at the widest part for about 15 chætigers. It is much damaged, and the terminal segments cannot be counted exactly. The distinctive feature is the complete absence of eyes. There is a broad caruncle extending to the 4th chætiger. The gills begin on the 5th. The bristles are damaged.

Genus *Pseudeurythoë* Fauvel.

Pseudeurythoë acarunculata n. sp.

Occurrence :

St. 160, Maldives, 37 m. (1).

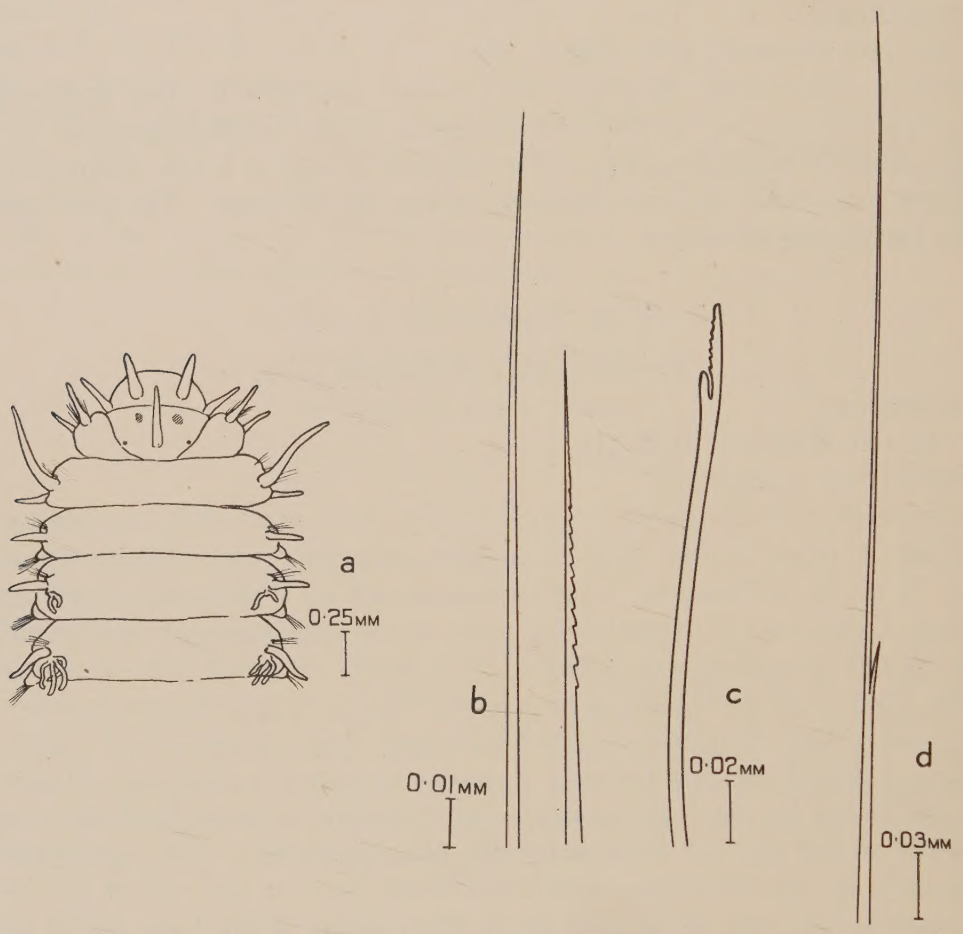
Distribution.—Maldives.

Description.—The single specimen is tightly coiled and brittle, so that an accurate measurement is impracticable. It is incomplete posteriorly, and measures about 30 mm. by 1 mm. for about 75 chætigers. The body-shape is very slender and vermiform. There is no colour. The head (Text-fig. 2*a*) is more or less rectangular in outline and divided into two regions by a transverse groove. It is deeply retracted into the first segments, and at the sides the first chætiger is on a level with the transverse groove and in contact with the bases of the palpophores. The hinder part of the prostomium is slightly broader than long and cut off squarely behind. *I can see no trace of a caruncle.* The back of the head is surrounded by the first chætiger, and when this is forced back there appears to be a kind of nuchal pit, but there is no sign of a raised area. The lateral tentacles lie just anteriorly to the transverse groove and reach back to the end of the head. The median tentacle is a little larger, and lies in the posterior half of the hinder part of the head. The palpostyles are lateral, and are situated just in front of the bristle-bundles of the first chætiger. There are two pairs of rather indistinct eyes, the front pair just behind the lateral tentacles and the hinder pair rather more lateral and on a level with the median tentacle. The first two chætigers are involved with the mouth. There are no hooks in the first chætiger.

The gills begin on the 4th chætiger, form fairly conspicuous bushy tufts in the anterior region, gradually taper away towards the middle of the body and disappear by the 50th chætiger.

The dorsal ramus of the feet is small and inconspicuous, and the bristles, which are few in number, come straight out of the body-wall. There is an elongate dorsal cirrus. The ventral ramus forms a low lobe about as long as the ventral cirrus, and has a much larger bristle-bundle than the dorsal ramus. The condition of the bristles is poor. The

dorsal bristles (Text-fig. 2*b*) are few, short and inconspicuous. They consist of very fine capillary bristles probably smooth towards the tips and a few rather stouter, but still delicate harpoon bristles, from which the teeth have for the most part disappeared. The ventral bristles are of two kinds, relatively short and stout bristles with a well-marked spur (Text-fig. 2*c*) and a denticulated tip, and very long and fine capillary bristles (Text-fig. 2*d*) with a small spur closely apposed to the main limb. These bristles have serrated ends. Simple capillary bristles without a spur appear to be absent, for all the capillary bristles in the ventral ramus seem to be furcate.



TEXT-FIG. 2.—*Pseudeurythoë acarunculata*. *a*, Anterior end from above. *b*, Dorsal bristles. *c*, Ventral bristle, stouter type. *d*, Ventral bristle, finer type.

REMARKS.—Both *Linopherus canariensis* Langerhans and *Paramphinome oculifera* Augener, which Fauvel justly refers to his recent genus *Pseudeurythoë*, are described as being without a caruncle. They both appear to be considerably smaller than the present species, and have the gills beginning on the 3rd and ending on about the 10th chætiger.

In its general facies and especially in the retraction of the head in the first segments the present species agrees with *Ps. microcephala* Fauvel, but differs in the absence of a caruncle, in having gills continued further over the body and in having furcate ventral capillary bristles. The position of the species must remain doubtful at present, and awaits further investigation in the light of better material.

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Pseudeurythoë ambigua (Monro).

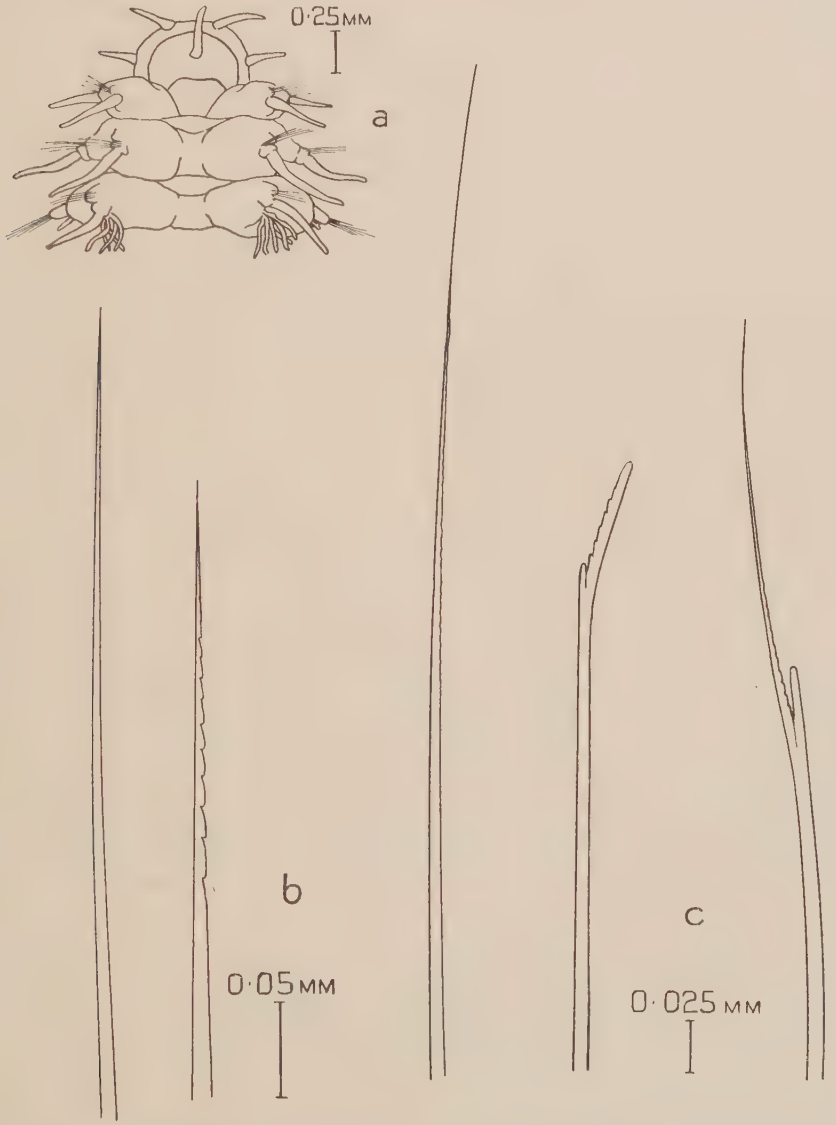
Eurythoë ambigua Monro, 1933, p. 6, text-fig. 2.

Occurrence :

St. 142B, Maldives, 37 m. (2).

Distribution.—Gulf of Panama, Maldives.

Remarks.—Shape slender and vermiform, tapering rather sharply in front and gradually behind. The type-specimen from Taboga Island measures 47 mm. by 2 mm. at the widest part for 82 chætigers. The present material consists of two anterior fragments, one measuring 12 mm. by 2 mm. for 28 chætigers, and the other 7 mm. by 1 mm. for 19 chætigers. The head (*v.* Monro, *loc. cit.*, fig. 2) is rounded in front, divided into two regions by a transverse groove running a little way behind the lateral tentacles, and is more or less rectangular, broader than long, behind (Text-fig. 3*a*). The hinder part is not heart-shaped as in *Ps. paucibranchiata* Fauvel.



Text-fig. 3.—*Pseudeurythoë ambigua* (Monro). *a*, Anterior end from above (eyes not shown). *b*, Dorsal bristles. *c*, Ventral bristles.

The caruncle consists of a rounded pad lying in the first chætiger. There are two pairs of eyes, which are very obscure, and in one of the present specimens invisible. One pair lies just behind the lateral tentacles, and the other at the sides of the head just in front of the median tentacle. The tentacles and palpostyles are about as long as the prostomium is broad and all more or less equal.

The first two chætigers carry conspicuous dorsal and ventral cirri and on the ventral side are involved with the mouth. The gills begin as small tufts on the 3rd chætiger (on the 4th in the smaller fragment), and rapidly increase in size till by the 5th chætiger they are large and conspicuous buncles of filaments. In the type they cease at the 44th chætiger, and in the larger of the two present fragments they are considerably reduced by the last (28th) chætiger, but still show about 5 filaments.

The notopodium is less prominent than the neuropodium, in which the lips of the chæta-sac form a projecting lobe a little shorter than the slender ventral cirrus. There are no hooks in the first chætiger, and the bristles are all very delicate. There is an elongate dorsal cirrus. The dorsal ramus has slender, white harpoon bristles and long, exceedingly fine capillary bristles apparently smooth at the ends (Text-fig. 3*b*). The ventral ramus carries (1) relatively stout, rather short bristles with a well-marked spur and clearly denticulated end-piece, (2) very long and fine capillary bristles similar to those in the notopodium except that they have denticulated ends, and (3) a number of capillary bristles with a very delicate spur closely apposed to the long arm (Text-fig. 3*c*). In regard to these last upper furcate capillary ventral bristles, they cannot be seen in the type; they appear to be very scarce, and are very difficult to find in the larger of the two present fragments, but in the smaller they are numerous and easily seen. As this last specimen is much smaller than the rest, a possible explanation may be that they disappear with age, but the condition of the bristles in the type is so poor that the absence of the slender, ventral, furcate kind cannot be asserted.

Remarks.—More material is required for the thorough understanding of the characters of this species. Except for the presence of the slender, furcate bristles these specimens agree with my *ambigua* more closely than with Fauvel's Indian Ocean *paucibranchiata*, but I am not convinced that the two species will not in the end prove to be identical. The chief differences are (1) the shape of the hinder part of the prostomium and (2) the distribution of the gills. In Fauvel's species the hinder part of the prostomium is heart-shaped, and in *ambigua* it is broader than long, more or less rectangular. It should be said, however, that all the specimens attributed by me to this species have the proboscis more or less extruded, and this is apt to cause changes in the shape of the prostomium. In *paucibranchiata* the gills cease at about the 25th chætiger, and in my species at about the 45th. With our present very imperfect knowledge of these two species it is better to keep them apart.

Genus *Eurythoë* Kinberg.

Eurythoë complanata (Pallas).

Fauvel, 1932, p. 45, with synonymy.

Occurrence :

St. M.B. Ic, Red Sea, 26 m. (1).

Distribution.—Tropical Atlantic, Indian and Pacific Oceans.

Genus *Chlœia* Savigny.

Chlœia tumida Baird ?.

Baird, 1868, p. 232, pl. iv, fig. 7 *a–d*.
Fauvel, 1917, p. 191.
Chlœia flava var. *tumida* Monro, 1931, p. 35.

Occurrence :

St. 147, Maldives, 27 m. (3).

Distribution.—North Australia, Singapore, Maldives.

Remarks.—These are young Chlœias, the largest of which measures 6 mm. by 1 mm. without the bristles for 18 chætigers. One specimen shows a little violet pigment on the median tentacle ; otherwise except for the eyes they are quite colourless. The bristles are very fine, and too much damaged for identification. These specimens may be young examples of Baird's species.

Chlœia fusca McIntosh.

McIntosh, 1885, p. 14, pl. ii, figs. 1, 2.
Fauvel, 1932, p. 56, with synonymy.

Occurrence :

St. 27, Gulf of Aden, 37–91 m. (1).

St. 43, South Arabian coast, 83–100 m. (2).

St. 111, Zanzibar, 73–165 m. (1).

St. 178, Gulf of Aden, 91 m. (1).

Distribution.—Australia, China, Bay of Bengal, Gulf of Aden.

Remarks.—The gill begins on the 5th chætiger and not on the 4th as in the *flava* group of species. All the specimens have a yellowish body colour and a pair of purple longitudinal dorsal stripes showing various degrees of fading.

Chlœia violacea Horst.

Horst, 1912, p. 22, pl. vii, fig. 8, pl. viii, figs. 8–11.

Occurrence :

St. 74, Gulf of Oman, 155 m. (3).

Distribution.—Malay Archipelago, Gulf of Oman.

Remarks.—Body fusiform. The caruncle extends to the 4th chætiger and the gills begin on this segment. The body colour is a pale yellow. In each segment there is a violet, or in faded specimens an orange, spot shaped like an inverted T, the transverse arm of which lies just in front of the hinder intersegmental groove. The dorsal cirri are purple, and the main stem of the gills is violet or brown. There is a purple stripe running down the middle of the caruncle. The median tentacle is about three times as long as the laterals and extends beyond the hinder end of the caruncle. In about the posterior half of the body the dorsal bristles show serrations at the end of the long limbs at their outer edge.

The present specimens are considerably smaller than those described by Horst. He gives a measurement of 22 mm. by 5 mm. without the bristles, whereas the largest of my examples measures only 9 mm. by 2 mm. for 21 chætigers. Moreover the spots on the back have faded to a pale orange and in one of the specimens have disappeared. Horst found serrated dorsal bristles in the 9th and following segments. In my specimens I can see none before about the 14th chætiger, but the condition of the bristles is very poor.

In 1924 (p. 72) I suggested that *C. conspicua*, *C. amphora*, *C. violacea* Horst, *C. parva* and *C. pulchella* Baird and *C. macleayi* Haswell were possibly colour-varieties of the well-known *Chlœia flava* (Pallas). There seems to be little else but a rather constant colour-pattern to distinguish one from another, and colour alone does not seem to be a good basis for specific distinction in the Polychæta.

Family Aphroditidæ.

Genus *Lætmatonice* Kinberg.

Lætmatonice producta Grube var. *benthaliana* McIntosh.

McIntosh, 1885, pl. viii, figs. 4, 5 ; pl. iv *a*, fig. 12 ; pl. v *a*, figs. 1, 2.
Fauvel, 1932, p. 10.

Occurrence :

St. 120, Zanzibar, 2926 m. (1).

St. 171, Central Arabian Sea, 3840–3872 m. (1).

Distribution.—Japan, Indian Ocean.

Remarks.—These specimens are in bad condition. One has 15 pairs of elytra and in the other they cannot be counted. There is no dorsal felting. Fauvel identifies the Japanese *Lætmatonice* of Moore and Izuka, with which his Indian Ocean specimens agree, with McIntosh's var. *benthaliana*. Unfortunately McIntosh's types are too much damaged for purposes of comparison. The Antarctic *producta* is a much larger form, up to about 18 cm. in length, and has 18–20 pairs of elytra.

Genus *Aphrodite* L.

Aphrodite talpa Quatrefages.

Fauvel, 1925, p. 140, fig. 4 *a–l*, and 1932, p. 8. *Non* Ehlers, *nec* Benham, Augener, Fauvel (1917).

Occurrence :

St. 106, Zanzibar, 183–194 m. (1).

Distribution.—New Zealand, South Australia, Indian Ocean.

Remarks.—A small specimen measuring 20 mm. by 12 mm. The median tentacle is shorter than the head. The dorsal bristles are long, rather slender, smooth and with delicate curved tips. They are covered with mud and lie obliquely along the back, and with the naked eye cannot be picked out from the general coating of mud.

Genus *Hermione* Blainville.

Hermione hystrix (Savigny).

Fauvel, 1923, p. 35, fig. 11 *a–j* ; and 1932, p. 10.

Occurrence :

St. 45, South Arabian Coast, 38 m. (1).

Distribution.—Atlantic, Mediterranean, Indian Ocean.

Remarks.—Except that I cannot see any fine capillary bristles this specimen agrees well with *H. hystrix*, of which Fauvel has made Grube's *malleata* a synonym. The capillary bristles are presumably lost.

Genus *Aphrogenia* Kinberg.

Aphrogenia alba Kinberg.

Fauvel, 1932, p. 9, with synonymy.

Occurrence :

St. M.B. IIc, South Arabian Coast, 29 m. (1).

Distribution.—West Indies, Indian Ocean.

Remarks.—This agrees with Horst's *villosa*, which Fauvel identifies with Kinberg's *alba*, except in the colour pattern. The elytra are not white or grey-brown but reddish-brown and the nacreous markings are confined to the outer half of the elytra, where they form an irregular pattern varying from scale to scale. In Augener's *margaritacea* the nacreous pattern is more regular and more widely distributed over the surface of the scale. There are conspicuous black spots on the dorsal surface of the cirrigerous parapodia as described by Horst for his *A. nigropunctata*, which Augener regards as a synonym of *villosa*. The specimen measures 6 mm. by 3 mm. for about 24 chætigers.

Family Polynoidæ.

Genus *Harmothoë* Kinberg.

Harmothoë cornuta (Potts).

Lagisca cornuta Potts, 1910, p. 339, pl. 19, fig. 14 ; pl. 21, fig. 48.
Lagisca cornuta Horst, 1917, p. 94.

Occurrence :

St. 108, Zanzibar, 786 m. (1).

Distribution.—Solomon Island, Malay Archipelago, Zanzibar.

Remarks.—There are 36–38 chætigers. The elytra are sand-coloured, and the dorsum is dark brown with traces of a complicated pattern.

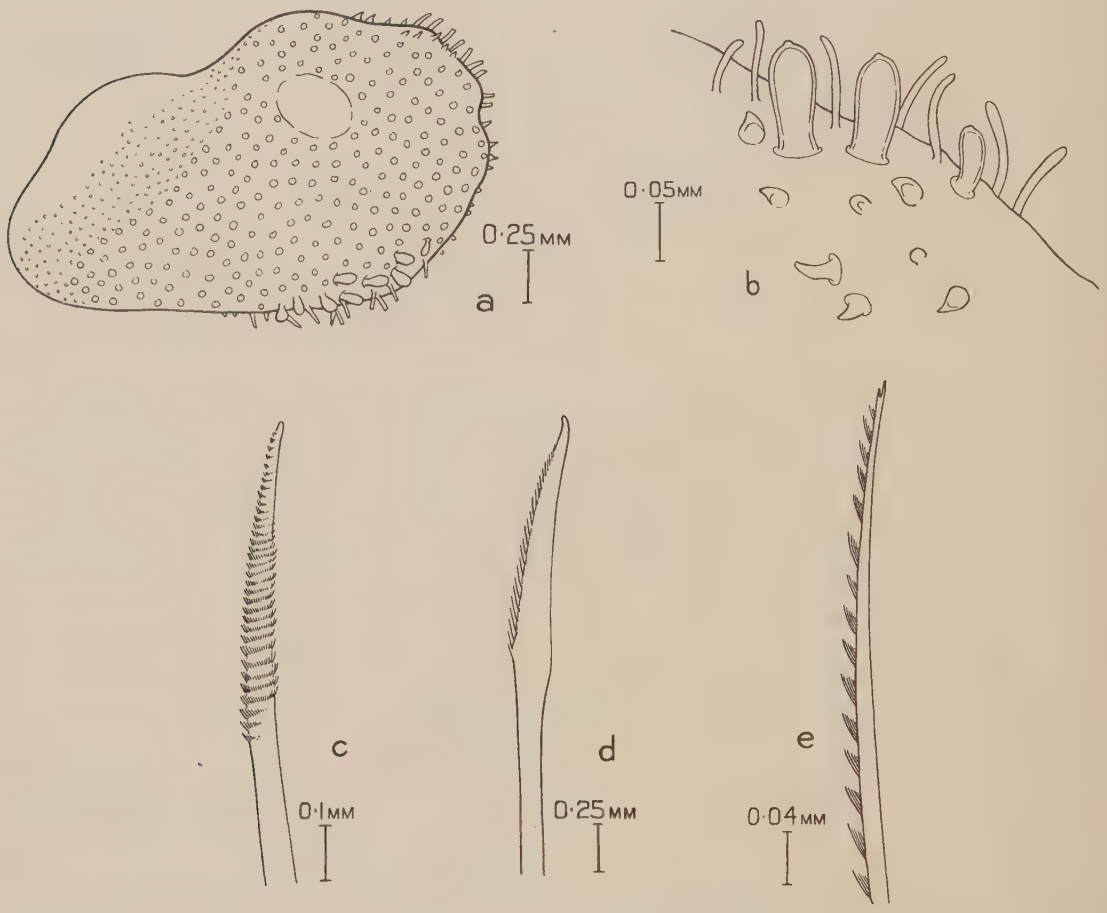
The head is deeply divided by a median groove and there are two pairs of large lateral eyes. The anterior and more lateral pair lie just above the cirrophores of the dorsal tentacular cirri. The posterior pair lie at the hinder corners of the head. The prostomial peaks are very marked, being pinched off into a pair of subulate papilliform processes. There is a large median tentaculophore. The median tentacle is not known. There is a pair of papillated lateral tentacles about as long as the head. They are very stout and cylindrical proximally and end in a filiform tip. Potts figures the palps as about twice as long as the head. They are smooth and tapering. The tentacular cirri are not known. The tentacular segment carries a few bristles.

The elytra (Text-fig. 4*a*) are sub-reniform. They are sparsely fringed at their hinder and outer borders, and carry (1) a large number of small curved spines, (2) a few large ovoid tubercles at the outer border (Text-fig. 4*b*).

In the feet there are a long tapering dorsal cirrus and a ventral cirrus extending to the end of the foot. Both pedal rami have large projecting sheathed acicula. There is a large bundle of strongly pectinated dorsal bristles (Text-fig. 4*c*). Potts says that they have a bifurcate apex. I believe the groove at the tip, which he figures, to be due to wear. Many of the dorsal bristles in the present specimen have the same appearance, but they are accompanied in the same foot by others that have the tip longer, more

pointed and entire. The ventral bristles are rather slender with long rows of frills. Those at the top and the bottom of the ventral ramus are unidentate (Text-fig. 4*d*), those in the middle bidentate (Text-fig. 4*e*). This is the condition in the type. Actually in the present specimen I cannot see any unidentate bristles in the upper part of the ventral ramus.

The present specimen measures 16 mm. by 2 mm. without the feet for 38 chætigers.



TEXT-FIG. 4.—*Harmothoë cornuta* (Potts). *a*, Elytron. *b*, Portion of elytron at hinder border. *c*, Dorsal bristle. *d*, Lower ventral bristle. *e*, Middle ventral bristle.

It is in very poor condition. The median tentacle, palps, tentacular and dorsal cirri are lost and only a few elytra in the anterior region are left.

The species has not a long attenuated hinder region, for there are less than 40 chætigers, and is therefore to be referred to *Harmothoë* rather than to *Lagisca*. Horst describes the elytra as being similar to those of *L. crosetensis* McIntosh. He failed to see the large ovoid tubercles. These may possibly be absent from the scales of the hinder region, as they are in the European *L. extenuata* (Grube). Actually the elytra in the present species are almost indistinguishable from those of Grube's species, to which the present species bears a great resemblance. *H. cornuta* is smaller with less than 40 chætigers, the head is divided by a deep median groove absent in *extenuata*, and the shape of the lateral tentacles is a little different. Otherwise there is little to separate the two species.

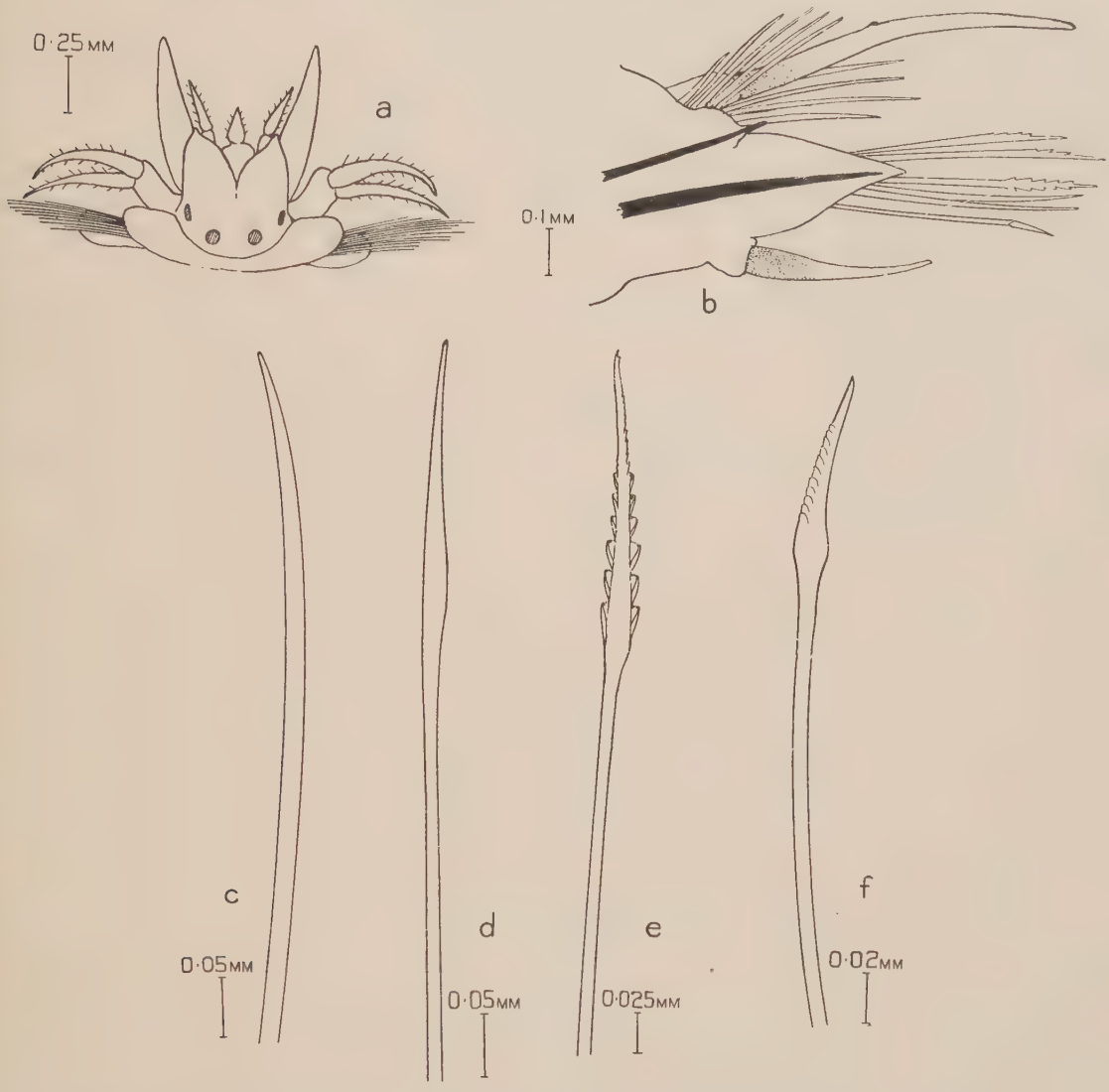
Harmothoë arabica n. sp.

Occurrence :

St. 139, Maldives, 57 m. (1).

Distribution.—Maldive area.

Description.—The specimen measures 7 mm. by 1 mm. without the feet for 36 chætigers. There is a little brown pigment on the head, brown mottling on the elytra,



Text-fig. 5.—*Harmothoë arabica*. *a*, Head from above. *b*, Middle foot. *c*, Dorsal bristle. *d*, Upper ventral bristle. *e*, Middle ventral bristle. *f*, Lower ventral bristle.

and the proximal half of the dorsal and ventral cirri is dark brown. Otherwise there is no colour. There is a typical harmothoid head (Text-fig. 5*a*) with well-developed peaks and two pairs of small eyes with a trapeziform arrangement. The anterior pair lies at the sides of the head just above the tentacular cirri and the posterior pair is more median and near the hinder border of the prostomium. There is a very short pyriform median

tentacle about half as long as the head. I suspect that it is incomplete. There is a pair of lateral tentacles, very stout proximally and about as long as the head. The subulate palps are slightly longer than this. The tentacular cirri are equal and about as long as the palps. The tentacles, tentacular and dorsal cirri are papillated. I see no papillæ on the ventral cirri.

Most of the elytra are lost, and the elytrophores are very difficult to count in the hinder region. As far as can be seen there are 16 pairs of elytra, the last pair very small and covering the pygidium. They are quite featureless, with neither tubercles nor papillæ. They are round, and have two patches of brown pigment.

As regards the feet (Text-fig. 5*b*), the ventral ramus is much more prominent than the dorsal. The notopod is supported by an aciculum with its end sheathed and projecting slightly. The notopodial bristles are numerous and a trifle stouter than the neuropodial. The ventral ramus sends out a long, pointed, triangular process. The dorsal cirri are very long, projecting beyond the ends of the neuropodial bristles. The ventral cirri are about half their length.

The dorsal bristles (Text-fig. 5*c*) are rather slender, slightly curved and quite smooth. Those at the bottom of the dorsal bundle are longer and straighter than the rest. The upper ventral bristles (Text-fig. 5*d*) are long, slender, lanceolate, unidentate and apparently quite smooth. There seem to be no transitional forms between these and the middle ventral bristles (Text-fig. 5*e*), which are also long and slender, but with well-developed rows of frills and a faintly bidentate tip. The lower ventral bristles are much shorter, faintly denticulated, with a wide subterminal enlargement and a tip that is either simple or faintly notched. There is a pair of long anal cirri, resembling the dorsal cirri.

Remarks.—I know no other *Harmothoë* with smooth dorsal and upper ventral bristles. The species has some affinity with *H. minuta* (Potts), which has serrated dorsal chætæ and a differently shaped head.

The specimen, despite its small size, is a ripe female full of eggs.

Harmothoë lunulata (Delle Chiaje).

Fauvel, 1923, p. 70, fig. 26 *a–o*.

Occurrence :

St. 45, South Arabian Coast, 38 m. (1).

Distribution.—Atlantic, Mediterranean, Gulf of Panama, Galapagos, Arabian Coast.

Remarks.—A variable species. Length up to 35 mm. for 36–39 chætigers. Head bilobed without well-marked frontal peaks. Two pairs of eyes with a trapeziform arrangement, the anterior pair at the sides of the head. Lateral tentacles, short pyriform. Elytra 15 pairs, unfringed, smooth except for one or two small patches of minute carinulate tubercles in the anterior angle. They have brown markings, usually in the shape of a ring or a V. The cirri are papillated, the dorsal being also pigmented. The dorsal ramus of the foot is reduced, and carries up to about 30 rather short, slightly curved denticulated bristles with blunt tips. The ventral is well developed and prominent, and carries numerous long bidentate bristles with rows of frills. The second tooth is straight and delicate. Sometimes the uppermost and lowest bristles in the ventral ramus are unidentate.

The present specimen is very small, measuring only 8 mm. by 1 mm. for 34 chætigers. The elytra are ringed with brown pigment, the ring being wider on the inner side of the scale than the outer. I have compared it with some examples of this species from St. Vaast. It has the prostomial peaks rather less developed than the European specimens, the dorsal bristles are very decidedly coarser, and the frills on the ventral bristles more highly developed and conspicuous. Moreover the ventral bristles are relatively a little shorter. Otherwise I can find nothing to distinguish the two forms. The present specimen has all the ventral bristles bidentate. I have also compared it with the examples of *H. lunulata* var. *pacifica* mihi from the Galapagos. The Galapagos specimens are much more slender and elongate, and have longer and more slender tentacles and tentacular cirri. The prostomial peaks are more developed and the markings on the elytra different. Otherwise I cannot separate them. Actually the present specimen is closer to the St. Vaast examples than are those from the Galapagos. Fauvel (*loc. cit.*) has commented on the great variability of this species, especially as regards the dorsal bristles. As far as I know this species has never been recorded from the tropics except for my records from the Galapagos and Panama regions.

This specimen is said to have been found living deeply embedded in the cavity of a sponge.

Genus *Hololepidella* Willey.

Hololepidella commensalis Willey.

Willey, 1905, p. 251, pl. i, figs. 17–20.
Fauvel, 1932, p. 30.

Occurrence :

St. 152, Maldives, 609–915 m. (1).

Distribution.—Ceylon, Mergui, Maldive area.

Remarks.—One specimen in very bad condition. It measures 41 mm. by 3 mm. without the feet for about 95 chætigers. From its size and from the structure of the bristles, which agree with the accounts of Willey and Fauvel, it seems probable that it belongs to this species. It was obtained from the central cavity of a calcareous sponge.

Genus *Eunoë* Malmgren.

Eunoë pallida (Ehlers).

Fauvel, 1932, p. 17, with synonymy.

Occurrence :

St. 145e, Maldives, 494 m. (7).

Distribution.—Indian Ocean, Malay Archipelago, Maldive area.

Remarks.—These specimens are all in very bad condition. The measurement is about 20 mm. by 4 mm. without the feet for about 38 chætigers. The head is harmothoid in type. The ventral bristles are unidentate and agree with Ehlers' figures. The specimens are probably of this species. The fine, almost capillary bristles at the top of the ventral ramus seem to be characteristic.

Genus *Allmaniella* McIntosh.

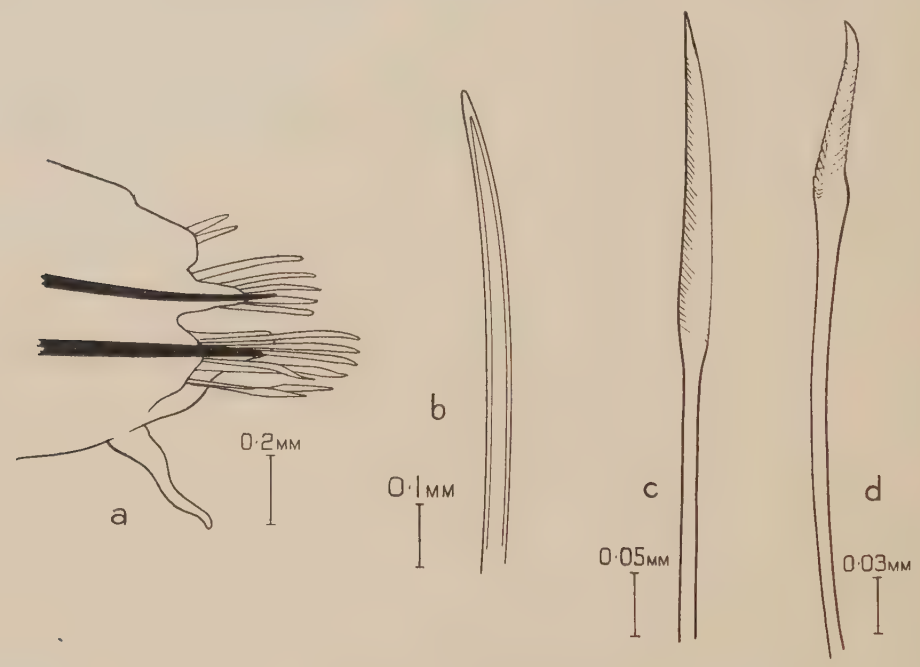
Allmaniella ? sp.

Occurrence :

St. 54, South Arabian Coast, 1046 m. (1).

St. 152, Maldives, 609–915 m. (7).

Remarks.—The condition of these specimens is such that I cannot confidently assign them to a genus. That from St. 54 is the best preserved, and this measures 20 mm. by 2 mm. without the feet for 49 chætigers. From the tapering of the body at the hinder end I judge it to be almost complete posteriorly. As far as can be seen, there are 15



Text-fig. 6.—*Allmaniella* sp. *a*, Foot. *b*, Dorsal bristle. *c*, Uppermost ventral bristle. *d*, Middle ventral bristle.

pairs of elytrophores and 18 chætigers behind the last pair. The heads are all distorted by what seems to have been a violent eversion of the proboscis, but they bear a general resemblance to Horst's (1917, pl. xviii, fig. 6) figure of that of *A. ptycholepis* (Grube). The head is broader than long, with a shallow median groove. There are two pairs of very large eyes, the anterior lying just above the insertion of the palps and the posterior a little more median. There is a small ceratophore of the median tentacle. Prostomial peaks are absent. The exact position of the lateral tentacles is very difficult to determine owing to the distortion of the head, but they appear to be subterminal rather than terminal. They are shorter than the head, very stout proximally, smooth and tapering. There is a pair of smooth, subulate palps, and of the tentacular cirri there remains a single ventral tentacular cirrus about half the length of the palps. The ventral cirrus of the first chætiger is a little shorter.

The elytra are all lost.

As regards the feet (Text-fig. 6*a*), the dorsal cirri are all lost, and the ventral are stout, smooth, and reach to the end of the ventral lobe. The dorsal ramus has a projecting

sheathed aciculum and a small bundle of about half a dozen bristles. The ventral ramus has the anterior lip of the chæta-sac prolonged into a triangular lappet. The dorsal bristles (Text-fig. 6*b*) are slightly stouter than the ventral, sword-like, quite smooth, and apparently grooved or excavated down the centre of the blade. The ventral bristles are numerous. At the top of the bundle there are a few, more slender than the rest (Text-fig. 6*c*), almost straight and with a very slight subterminal enlargement. They show only at high magnification very faint traces of denticulation in the form of slight grooving. The remainder of the ventral bristles (Text-fig. 6*d*) have a marked subterminal enlargement and a strongly curved tip. They are unidentate, and also show only very faint traces of denticulation. They resemble the ventral bristles of McIntosh's *Eunoë opalina*.

The number of chætigers (50 or more), the absence of prostomial peaks, the presence of only 15 pairs of elytrophores, the smooth dorsal bristles and the hooked, unidentate ventral bristles are a combination of characters which, as far as I know, is distinctive. They have certain affinities with *Allmaniella*, which has a rather similar head (but with terminally inserted lateral tentacles) and more or less smooth dorsal bristles. The shape of the feet is also similar, but *Allmaniella* has bidentate ventral bristles. They are perhaps referable to *Hermadion*. Horst's *Lagisca elytrophora* has somewhat similar bristles, but it presumably has prostomial peaks and there are no eyes. Izuka's *Harmothoë sinagawaensis* has rather similar ventral bristles, but it is a true *Harmothoë* with only 38 segments.

I suspect that these specimens represent a new species, but the material is inadequate for a proper diagnosis.

The specimens from St. 152 are said to have been found living in holes in the arms of a calcareous branching sponge.

Genus *Nectochæta* Marenzeller.

Nectochæta caroli Fauvel.

Fauvel, 1923, p. 91, fig. 35 *a–f*.
Monro, 1930, p. 46.

Occurrence :

St. 76B, Gulf of Oman, depth 600 m. (1).

Distribution.—Mediterranean, Atlantic, Gulf of Oman.

Remarks.—There are two fragments, an anterior and a posterior, probably parts of the same specimen. They are together composed of 26 chætigers and there are 12 pairs of elytrophores. The elytra are lost. The fragments correspond closely to Fauvel's description, except that the dorsal ramus is supported not only by a single aciculum, but also by two or three stout bristles embedded, like the aciculum, in the tissue of the foot.

Nectochæta grimaldii Marenzeller.

Fauvel, 1923, p. 90, fig. 34 *a–i*.

Occurrence :

St. 96, Central Arabian Sea, depth 400–645 m. (1).

Distribution.—Mediterranean, Atlantic, Arabian Sea.

Remarks.—This specimen measures 11 mm. by 1 mm. for 25 chætigers. All the elytra and dorsal cirri are lost. There are 12 pairs of elytrophores. The dorsal bristles

are nearly all broken off level with the foot, but I succeeded in finding one intact dorsal bristle. If, as Fauvel believes, this species is the young of the Indian Ocean *Lepidasthenia maculata* Potts, it seems probable that Chamberlin's *Harmopsides natans* from the Pacific, with its 18 pairs of elytrophores and its lack of bristles in the dorsal ramus, represents a later stage in the development of the same species.

Family Sigalionidæ.

Genus *Sigalion* Audouin and Milne-Edwards.

Sigalion mathildæ Audouin and Milne-Edwards.

Fauvel, 1923, p. 103, fig. 39 *a–l*.

Occurrence :

St. 80, South Arabian Coast, 16–22 m. (3).

Distribution.—Atlantic, Mediterranean, West Indies, Madagascar, South Arabian Coast.

Remarks.—Three fragmentary specimens in poor condition, the largest measuring 37 mm. by 3 mm. without the feet for 65 chætigers. I have compared them with some examples of this species from St. Vaast, and the differences are in my opinion too slight to warrant separation. The branches of the pinnate elytral papillæ are fewer, 8 to 10 on each side at about the 25th chætiger instead of 10 to 20, and are lanceolate rather than cylindrical. In fact the elytral papillæ resemble those of *S. squamatum* Delle Chiaje. Otherwise I can find nothing to distinguish the Indian Ocean from the European form.

I see only one pair of eyes. The slender dorsal and ventral tentacular cirri are about equal. The gill begins at the 4th chætiger. There are 3 ctenidia, the dorsal ramus has a single conical stylode, and the ventral also a small blunt stylode on its upper face. The dorsal bristles are finely denticulated capillaries with curved tips.

The upper bundle of ventral bristles contains about half a dozen simple bipectinate bristles and a number of multiarticulate compound bristles with claw-like tips. Some of these have the top of the shaft denticulated. The lower bundle of ventral bristles contains a few compound bristles with stout single-jointed blades and a great number of very slender multi-articulate bristles.

This species has been recorded from the West Indies by myself and from Madagascar by Fauvel (1919, p. 343). Augener (1927, p. 91) has attributed specimens from off New South Wales to Grube's *S. amboinensis* described from Amboina (Grube, 1877, p. 520), and also makes Horst's *S. bandaensis* a synonym of Grube's species. In Augener's opinion *S. amboinensis* is the Indo-Pacific representative of the European *S. mathildæ*. His description of the examples which he attributes to Grube's species seems, however, to present certain difficulties. Grube states that in his species there are no ctenidia; Augener's specimens had ctenidia, and he regards Grube's affirmation of their absence as a mistake due to poor material or insufficient observation. Augener failed to find any single-jointed compound chætæ in the feet, but owing to the difficulty of the material he does not regard his failure as conclusive of their absence. Now *Sigalion ovigerum* Monro recorded from Port Jackson and from New Zealand is characterized by the absence of single-jointed compound bristles, and I strongly suspect that Augener had examples

of this species before him. That my species is identical with Grube's does not seem to me at all certain. It is only an assumption that ctenidia are really present in *amboinensis*, and the absence of single-jointed chætæ cannot be inferred from Grube's description. The question can only be settled by reference to Grube's type.

Augener makes Horst's *bandaensis* a synonym of his *amboinensis* Grube. Horst's species is described as having mostly single-jointed compound bristles in the *upper* neuropodial bundle and seems to me to be distinct.

Genus *Leanira* Kinberg.

Leanira vulturis Horst.

Horst, 1917, p. 118, pl. xxv, figs. 5–7.

Occurrence :

St. 191, Gulf of Aden, 274 m. (3).

Distribution.—Malay Archipelago, Gulf of Aden.

Remarks.—Three fragmentary specimens, the largest of which measures about 50 mm. by 2 mm. without the feet for 88 chætigers. They agree well with Horst's account except in the following particulars : Horst gives 2 pairs of eyes—an anterior and posterior ; in these specimens an anterior pair only is faintly visible. Horst's specimens had tentacular ctenidia ; in these they are absent. The median and lateral tentacles are very short, and consist of a ceratophore and 2 joints, a stout basal joint and a subulate terminal joint. The ventral tentacular cirrus is about half the size of the dorsal.

The elytra are transversely elongate, smooth and notched at the hinder edge of the external margin. The gill appears first at about the 15th chætiger. The feet carry very numerous stylodes and 3 ctenidia ; 2 or 3 simple bipectinate bristles are present in the upper part of the neuropodia.

It is possible that these specimens represent a distinct form without posterior eyes and without tentacular ctenidia, but in view of the fact that in preserved material the aspect of the eyes is apt to be very variable and that tentacular ctenidia may easily be lost, I do not feel justified in making a separation. The species agrees with *L. japonica* in the possession of bipectinate chætæ in the neuropods, but differs in having short stumpy tentacles somewhat similar to those of *L. hystricis*.

Leanira japonica McIntosh.

Fauvel, 1932, p. 33, with synonymy.

Occurrence :

St. 137, Maldives, 46 m. (5).

St. 142B, Maldives, 37 m. (1).

Distribution.—Japan, Malay Archipelago, Indian Ocean, Maldive area.

Remarks.—These specimens are all incomplete. Both Izuka and Horst (under *L. sibogæ*) say that the hinder pair of eyes is the larger. In these specimens the kidney-shaped, anterior, subtentacular eyes are decidedly larger than the posterior pair. The median tentacle is as long as the dorsal tentacular cirrus. I can find no simple, bipectinate bristles in the neuropod. As Fauvel and others have shown, their presence is very inconstant.

Genus *Euthalanessa* Darboux.

Euthalanessa djiboutiensis (Gravier).

Fauvel, 1932, p. 32, with synonymy.

Occurrence :

St. 144, Maldives, 31 m. (1).

Distribution.—Red Sea, Ceylon, Mergui, Maldives.

Remarks.—A damaged anterior fragment without tentacles or palps. The ocular pigment is very conspicuous. There is a rust-coloured spot on each scale. Multi-articulate compound bristles are absent from the 4th to about the 12th chætiger. In my opinion this species is very doubtfully separable from McIntosh's *oculata*.

Family Polyodontidæ.

Genus *Polyodontes* Renier.

Polyodontes melanonotus (Grube).

Fauvel, 1932, p. 37, text-fig. 6, with synonymy.

Occurrence :

St. 72, Gulf of Oman, 73 m. (2).

Distribution.— West Indies, Malay Archipelago, Ceylon, Gulf of Oman.

Remarks.—Two anterior fragments in poor condition, the larger measuring 7 mm. in breadth without the feet. The ommatophores are clavate; there are small globular processes above the dorsal cirri and pseudo-penicillate bristles are present. The elytra are faintly areolated.

Polyodontes sp.

Occurrence :

St. 189, Gulf of Aden, 91 m. (1).

Remarks.—A single anterior fragment of a small panthalid. It measures 12 mm. by 2 mm. without the feet for 33 chætigers. It is puzzling because it agrees with *P. maxillosus* in having large cylindrical ommatophores and no pseudo-penicillate bristles, but differs in having small globular processes above the dorsal cirri. These processes are present in *P. melanonotus*, but it cannot be referred to that species because of the absence of pseudo-penicillate bristles. I suspect it of representing a young stage of one or the other of these two species, probably *melanonotus*.

Genus *Panthalis* Kinberg.

Panthalis œrstedi Kinberg.

Fauvel, 1932, p. 39, text-fig. 7, with synonymy.

Occurrence :

St. 106, Zanzibar, 183–194 m. (1).

Distribution.—Atlantic, Mediterranean, Pacific, Indian Ocean.

Remarks.—A single, anterior, damaged fragment having ommatophores and true penicillate chætæ. It probably belongs to this species. Usually the ommatophores

are colourless and there are no eye-spots on the prostomium. In this specimen the tops of the ommatophores are ringed with reddish-brown, and there is a pair of reddish eye-spots on the dorso-lateral surface of the head just behind the bases of the ommatophores.

Family Chrysopetalidæ.

Genus *Chrysopetalum* Ehlers.

Chrysopetalum occidentale H. P. Johnson.

H. P. Johnson, 1897, p. 161, pl. v, figs. 15 and 16 ; pl. vi, figs. 17–19.
Augener, 1913, p. 78.
Monro, 1933, p. 19.

Occurrence :

St. 45, South Arabian Coast, 38 m. (2).

St. 53, South Arabian Coast, 13·5 m. (1).

Distribution.—California, Galapagos, South-west Australia, South Arabian Coast.

Remarks.—These specimens are in fragments. I have compared them with some examples from the Galapagos Islands, and in my opinion they are conspecific. Gravier's *C. ehlersi* is probably the same species, but both he and Gravely refer to the anterior pair of eyes as being in contact and ventrally situated. In these specimens the anterior pair of eyes is clearly visible from the dorsal surface and they do not touch each other.

Family Phyllodocidæ.

Genus *Phyllodoce* Savigny.

Phyllodoce madeirensis Langerhans.

Fauvel, 1932, p. 70, with synonymy.

Occurrence :

St. M.B. Id, Red Sea, 26 m. (1).

St. 27, Gulf of Aden, 37–91 m. (2).

St. 45, South Arabian Coast, 38 m. (3).

Distribution.—Atlantic, Mediterranean, Pacific, Indian Ocean.

Genus *Notophyllum* Oersted.

Notophyllum splendens (Schmarda).

Augener, 1913, p. 140, fig. 11, with synonymy.
Monro, 1934, p. 359.
Phyllodoce multicirris Grube, 1878, p. 100, pl. vi, fig. 4.

Occurrence :

St. 45, South Arabian Coast, 38 m. (1).

Distribution.—South-west Australia, Philippines, China, South Arabian Coast.

Remarks.—A single specimen measuring 16 mm. by 1 mm. without the feet. Colour in spirit greenish yellow. Head small, oval, broader than long ; a long median tentacle almost twice as long as the head ; lateral tentacles spindle-shaped, about as long as the

head. One or sometimes two pairs of large dark eyes. In the present specimen there is only one pair, but Grube (*loc. cit.*) figures two pairs. There are 3 pairs of cirriform nuchal processes. These are well figured by Grube. Four pairs of tentacular cirri. First tentacular segment reduced dorsally. Dorsal cirri ear-shaped, ventral cirri ovate.

The nuchal organs in Marenzeller's *N. japonicum* have, as far as I know, never been described, and Izuka's *N. sagamianum* has nuchal organs with 4 pairs of processes. Otherwise it does not appear to be separable.

Genus *Eulalia* Oersted.

Eulalia tenax Grube.

Grube, 1878, p. 99, pl. vi, fig. 3.
Pterocirrus brevicornis Ehlers, 1904, p. 17, pl. ii, figs. 10–12.
Pterocirrus ceylonicus Michaelsen, 1892, p. 13, figs. 7, 8.
Eulalia magalhaensis Fauvel, 1919, p. 364, fig. iii; and 1932, p. 71; *nec* Kinberg.

Occurrence :

St. 53, South Arabian Coast, 13·5 m. (1).

Distribution.—Red Sea, Indian Ocean, Australia, New Zealand, South Arabian Coast.

Remarks.—I am inclined to agree with Fauvel in uniting *Pt. brevicornis* Ehlers with *Pt. ceylonicus* Michaelsen, but I have already affirmed (1933, p. 20) my inability to accept Fauvel's view that Kinberg's southern *magalhaensis* is the same as the tropical form. I have examined a number of antarctic specimens of Kinberg's species and I find no bristles in the second tentacular segment.

Genus *Lopadorhynchus* Grube.

Lopadorhynchus uncinatus Fauvel.

Fauvel, 1932, p. 75.

Occurrence :

St. 96, Central Arabian Sea, 400–645 m. (1).

Distribution.—Atlantic, Mediterranean, Maldives, Arabian Sea.

Remarks.—The specimen measures 12 mm. by 1 mm. without the feet for 28 chætigers.

Lopadorhynchus brevis Grube.

Fauvel, 1923, p. 184, fig. 69*k*.
Ehlers, 1913, p. 463.
Monro, 1930, p. 78.
Lopadorhynchus nans, Chamberlin, 1919, p. 116, pl. xvii, figs. 1–5.

Occurrence :

St. 186, Gulf of Aden, 250–0 m. (2).

Distribution.—Atlantic, Mediterranean, Pacific, Gulf of Aden.

Remarks.—These specimens measure about 12 mm. by 1 mm. without the feet for 25 chætigers. There is no colour. The head is cut off squarely in front and there are

2 pairs of tentacles, of which the upper is about twice the length of the lower. There are 2 pairs of tentacular cirri reaching back to the second chætiger, and a third rudimentary pair at the base of the second pair. There are 2 pairs of very indistinct eyes. The first 3 pairs of feet are only slightly shorter and stouter than those that follow. They have simple bristles only, and are without ventral cirri. The fourth foot has only paddle-shaped compound bristles above the aciculum and only simple bristles below it. A ventral cirrus is present. The remaining feet have a few simple bristles in addition to the compound chætæ.

As far as I know, Grube's species has never been thoroughly described, but Chamberlin claims that *L. brevis* has only a few simple bristles in the 4th foot instead of exclusively simple bristles in the ventral half. I am not inclined to attach much importance to this as a specific differential, for I suspect that the number of simple bristles in the 4th foot changes with the growth of the animal. Chamberlin has described a small *Lopadorhynchus* (*L. parvum* Chamberlin, 1919, p. 114) between 4 and 5 mm. in length which has only a few simple bristles in the 4th foot. I believe this to be a young example of Grube's *brevis*. The fact that no eyes were seen seems to me to have no importance, for the ocular pigment is clearly liable to disappear. Chamberlin describes for his *L. nans* postsetal processes on the first 3 feet which he regards as rudimentary ventral cirri. These I have not seen, but the state of preservation of the material is not good.

Lopadorhynchus brevis Grube var. *nuchalis* var. nov.

Occurrence :

St. 186, Gulf of Aden, 250–0 m. (1).

Distribution.—Gulf of Aden.

Description.—This specimen is indistinguishable from the examples of *L. brevis* with which it was taken except that (1) I can see no trace of eyes dorsally; (2) just behind the dorsal tentacles there is a pair of nuchal organs, each with 4 or 5 small finger-like processes; (3) on the lower surface of the head below the nuchal organs there is a pair of small patches of brown pigment, which I take to be ocular in character.

Remarks.—It is very possible that this specimen is simply a *brevis* with the nuchal organs everted, but I have not sufficient material to decide this. Chamberlin (1919, p. 119) has established a genus *Mastigethus* for a form *Mastigethus errans* very similar to the present specimen. He separates *Mastigethus* from *Lopadorhynchus* on the presence in the former of conspicuous, branching nuchal organs and of a pair of lateral processes arising from near the mouth of the proboscis. The present specimen has very similar nuchal organs but lacks the œsophageal processes, unless these be the lateral œsophageal glands generally present in *Lopadorhynchus*. These glands in *brevis* arise a little further back on the proboscis than indicated in Chamberlin's figure. Chamberlin's *errans* is distinctive in having no ventral cirrus on the 4th foot.

Claparède (1870, p. 465) for his *Hydrophanes* (*i. e. Lopadorhynchus*) *krohnii* describes eversible nuchal organs having the form of " boutons ciliés ", and it is probable that they are generally present in the genus. I therefore am of the opinion that *Mastigethus* should be placed in synonymy with *Lopadorhynchus*.

Family Alciopidæ.

Genus *Rhynchonerella* Costa.

Rhynchonerella fulgens Greeff.

Fauvel, 1923, p. 210, fig. 79 *a–d*.
Monro, 1930, p. 83, fig. 26.

Occurrence :

St. 61b, North Arabian Sea, 1000–0 m. (2).

St. 61c, North Arabian Sea, surface (1).

St. 96, Central Arabian Sea, 400–645 m. (1).

Distribution.—Atlantic, Mediterranean, South Sandwich Islands, Arabian Sea.

Remarks.—These are all fragments, which as far as they go correspond to Greeff's species. In the anterior region the stout acicular bristles are numerous, but in the middle and hinder regions are reduced to a single chæta. The foot has no cirriform process and the long capillary bristles are compound.

Genus *Vanadis* Claparède.

Vanadis formosa Claparède.

Fauvel, 1923, p. 205, fig. 77 *a–c*.
Monro, 1936, p. 116.

Occurrence :

St. 13d, South Arabian Sea, 500–0 m. (1).

Distribution.—Atlantic, Mediterranean, Pacific, Indian Ocean.

Remarks.—A single specimen broken into pieces. There are 3 pairs of tentacular cirri. Dark segmental glands are present in every segment. The specimen is a female.

Family Tomopteridæ.

Genus *Tomopteris* Eschscholtz.

Tomopteris (*Johnstonella*) *dunckeri* Rosa.

Rosa, 1908, p. 276, pl. xii, figs. 7–9.

Occurrence :

St. 7, Red Sea, 100–0 m. (3).

Distribution.—Ceylon, New Guinea, Red Sea.

Remarks.—The largest specimen, probably complete, has a tail about three-fourths as long as the body, and measures about 25 mm. by 1 mm. without the feet for 26 pairs of feet, of which about the first 18 are true body-segments. In the caudal region the feet are much reduced but continued to the end of the animal. There is no naked caudal cylinder. A second specimen has 19 pairs of feet and a small damaged tail in which the feet are all broken away, only a few shreds remaining. This measures 12 mm. in length for the body and 2 mm. for the tail. The third specimen has 19 body-segments and the tail is lost. It measures 12 mm. in length. There is a notch between the prostomial horns. A pair of black eyes is present. The scars marking the position of the anterior pair of cirri are clearly visible. The 2nd pair of cirri is about as long as the body without the tail. All the feet are provided with a sting in the ventral pinnules. In the

first 2 pairs of feet there are rosettes on the trunks near the point of division. Further back there are small rosettes in the pinnules lying below and above the dorsal and ventral trunks respectively, in the positions indicated by Rosa. There is a chromophil gland lying below the ventral trunk from the 3rd foot backwards. There are no hyaline glands. The gonad is confined to the dorsal ramus.

This species is immediately distinguished from *duccii* by the absence of hyaline glands. It has previously been taken off Ceylon and New Guinea. Rosa separates it from *T. aloysii-sabaudiæ* chiefly on the ground that the feet are continued to the end of the tail, whereas in *aloysii-sabaudiæ* the body ends in a naked cylinder. I share Fauvel's (1935, p. 298) opinion that in view of the extreme delicacy of the tail in the Tomopterids and the fragility of the feet this distinction is very doubtful. The question can be decided only by more and better-preserved material.

Tomopteris (*Johnstonella*) *duccii* Rosa.

Rosa, 1908, p. 273, pl. xii, figs. 1, 2.

Occurrence :

St. 131D, South Arabian Sea, 1500–0 m. (1).

Distribution.—Bay of Bengal, Arabian Sea.

Remarks.—A single specimen with the tail damaged. It measures 11 mm. by 1 mm. without the feet for 16 pairs of feet. It is incomplete posteriorly. There is no notch between the prostomial horns. A pair of conspicuous eyes is present. There is an anterior pair of cirri a little shorter than the prostomial horns, and the posterior pair is about two-thirds as long as the body. The first 2 feet have a large rosette on the trunk. Behind this the rosettes are situated just below and above the tips of the dorsal and ventral trunks respectively, as shown in Rosa's figure. According to Rosa all the feet have a pointed sting (*aculeo*) on the ventral surface of the pinnules, though little developed in the first 2 feet. In my specimen this sting appears to be absent from the first foot but is well developed in all the rest. Hyaline glands are present in all the feet just distal to the sting, and from the 5th foot there are also large chromophil glands lying just underneath the trunk of the ventral rami.

The gonad is confined to the dorsal ramus.

My specimen agrees on the whole well with Rosa's description and figures. The species is remarkable for the possession of all the three kinds of pedal glands, rosettes, hyaline and chromophil glands and an *aculeo*. It was originally taken in the Bay of Bengal.

St. 96 (depth 10 m.) yielded a much damaged specimen that very probably belongs to this species. It measures about 8 mm. in length with a naked tail of 1 mm. It is impossible to make an exact count of the parapodia. The feet are damaged, but as far as can be seen the number and arrangement of the glands are similar to those in the specimen from St. 131D.

Tomopteris cavallii Rosa

Fauvel, 1923, p. 222, fig. 84 *a*.

Occurrence :

St. 61B, North Arabian Sea, 1000–0 m. (2).

Distribution.—Atlantic, Indian Ocean, Arabian Sea.

Remarks.—Two very small specimens, the larger measuring 4 mm. in length for 12 pairs of feet. The only gland that I can find is a large chromophil gland lying below the ventral trunk, and I believe them to be young examples of this species. A small gonad is visible in the dorsal ramus. There is no sign of a first pair of chætigerous appendages.

Tomopteris planktonis (?) Apstein.

Fauvel, 1923, p. 224, fig. 84 *f*.

Occurrence :

St. 96, Central Arabian Sea, 10 m. (1).

Distribution.—Atlantic, Mediterranean, South Georgia, ? Arabian Sea.

Remarks.—One small damaged fragment, the feet of which show a large chromophil gland below the ventral trunk and a hyaline gland distal to it towards the edge of the pinnule.

Family Hesionidæ.

Genus *Hesione* Savigny.

Hesione intertexta Grube.

Monro, 1926, p. 311 ; and 1931, p. 9.

Occurrence :

St. 53, South Arabian Coast, 13·5 m. (1).

Distribution.—Philippines, Australia, Indian Ocean.

Remarks.—Usual size about 40 mm. by 5 mm. Body-colour in spirit varies from pale yellow to pale green with a very conspicuous brown dorsal striping. In the bristles the accessory tooth of the chætal guard approaches the apical tooth. Fauvel (1932, p. 60) regards this species as a synonym of the European *H. pantherina* Risso.

Family Syllidæ.

Genus *Syllis* Savigny.

Syllis variegata Grube.

Fauvel, 1923, p. 262, fig. 97 *h–n* ; and 1932, p. 76.

Occurrence :

St. 10, Red Sea, 55 m. (1).

St. 24, Gulf of Aden, 73–200 m. (1).

St. 44, South Arabian Coast, 0 m. (1).

St. 45, South Arabian Coast, 38 m. (3).

St. 53, South Arabian Coast, 13·5 m. (2).

Distribution.—Atlantic, Mediterranean, Pacific, Indian Ocean.

Remarks.—I have nothing to add to the numerous accounts of this widely distributed species. The specimens from St. 45 are rather puzzling. They are milk-white in colour, of considerable size, the largest fragment measuring 35 mm. in length, and with rather a low number of large articles to the dorsal cirri. In the anterior region the number of articles is 30–20 and in the middle and hinder regions 20–15. Moreover the bristles project very little beyond the pedal lobes. In this they resemble *S. inflata* Marenzeller. In other respects they agree with Gravier's Red Sea *S. compacta*, except that they are devoid of colour-markings.

Fauvel (1935, p. 300) has thrown *S. compacta* in with *variegata*, and although I am not satisfied that these specimens actually belong to *variegata*, I cannot find in them any good ground for separation.

Syllis gracilis Grube.

Fauvel, 1923, p. 259, fig. 96 *f–i* ; and 1932, p. 76.

Occurrence :

St. M.B. Ib, Red Sea, 29 m. (1).

St. 45, South Arabian Coast, 38 m. (1).

St. 112, Zanzibar, 113 m. (1).

St. 157, Maldives, 229 m. (4).

Distribution.—Atlantic, Mediterranean, Pacific, Indian Ocean.

Remarks.—This species is easily recognizable by the large crutch-like simple chætæ in the middle and hinder regions.

Syllis krohnii Ehlers.

Fauvel, 1923, p. 259, fig. 96 *a–e* ; and 1930, p. 13.

Occurrence :

St. M.B. Ib, Red Sea, 29 m. (1).

St. 10, Red Sea, 55 m. (1).

Distribution.—Atlantic, Mediterranean, Indian Ocean, Red Sea.

Remarks.—The specimen from St. M.B. Ib, shows the usual transverse banding in the anterior region ; in that from St. 10 it is not visible. The articles of the cirri are numerous, short and crowded. The bristles are unidentate except in the anterior region, where a small accessory tooth is usually present.

Syllis brachychæta Schmarda.

Augener, 1918, p. 247, pl. iv, figs. 83–85 ; pl. v, fig. 98, text-fig. xx.
Syllis closterobranchia Schmarda, Fauvel, 1932, p. 77.

Occurrence :

St. 45, South Arabian Coast, 38 m. (2).

St. 53, South Arabian Coast, 13·5 m. (4).

Distribution.—Indian Ocean, South Africa, Australia, New Zealand, South Atlantic.

Remarks.—I am inclined provisionally to accept Augener's attempted unravelling of the complex synonymy of this species. Fauvel gives as a specific character that the bristles in the middle region of the body are unidentate. I am not convinced that this is so in all specimens, and I believe that in some a small second tooth, often very difficult to see, persists throughout.

Syllis curticirris n. sp.

Occurrence :

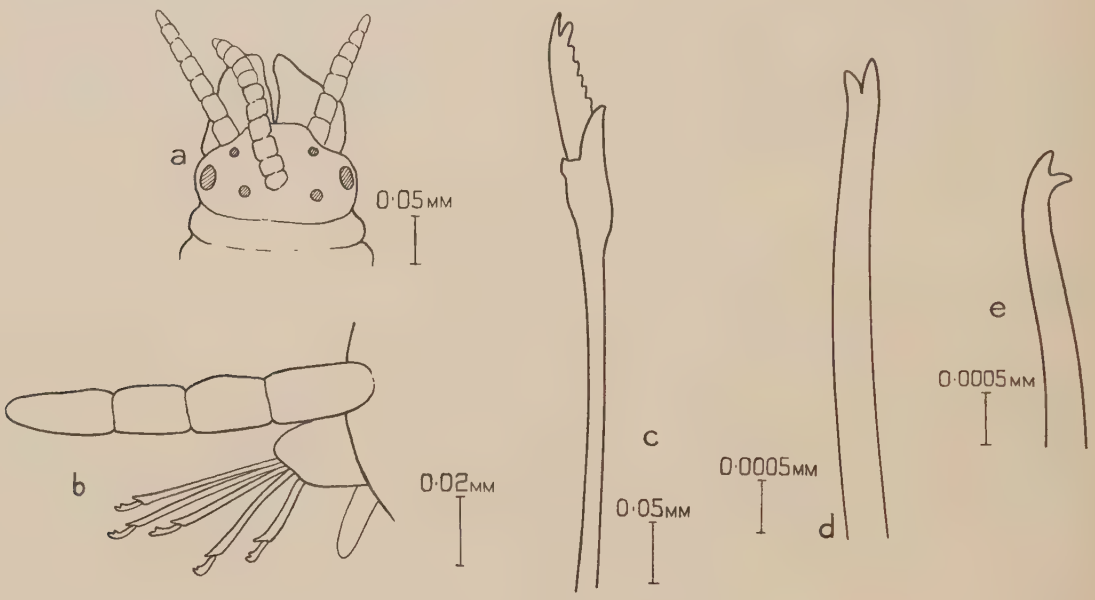
St. 112, Zanzibar, 113 m. (1).

Distribution.—Zanzibar.

Description.—A single ripe female measuring 6 mm. in length for about 60 chætigers. The body is slender, thread-like, and there is no colour. The palps are clearly divided (Text-fig. 7*a*). There are 2 pairs of eyes in a semicircle. Also an accessory pair of small

anterior eyes. The tentacles are about equal with about 10 articles. All the tentacular cirri are lost except one and this has 3 articles. I believe it to be incomplete. For the first few chætigers behind the head the dorsal cirri have about 10 articles. Behind this and throughout the rest of the body they are exceedingly short, having 4 and 3 articles alternately. Foot (Text-fig. 7*b*) conical. Ventral cirrus short, conical; shows no change throughout the body. Pharyngeal tooth not quite terminal. I have not been able to see the pharyngeal papillæ. Pharynx extends to 6th chætiger and proventriculus to 11th.

The feet carry about 6 bristles. These all have slender shafts and clearly bidentate



TEXT-FIG. 7.—*Syllis curticirris*. *a*, Head from above. *b*, Middle foot seen from above. *c*, Bristle. *d*, Simple dorsal hook from hinder region. *e*, Simple ventral hook from hinder region.

end-pieces (Text-fig. 7*c*). They vary very little throughout the body. In the hinder region there is a large dorsal simple bidentate hook (Text-fig. 7*d*) and a smaller ventral one (Text-fig. 7*e*).

REMARKS.—I know no other *Syllis* with dorsal cirri so short. It appears to be related to the European *S. brevipennis* Grube, but differs in being unpapillated and in having the dorsal cirri slender instead of thick and fusiform.

Syllis sp. juv.

OCCURRENCE :

St. M.B. Ib, Red Sea, 29 m. (1).
St. M.B. Id, Red Sea, 26 m. (1).
St. 27, Gulf of Aden, 37–91 m. (1).
St. 53, South Arabian Coast, 13·5 m. (1).

REMARKS.—These are all small Syllids about 5 mm. in length. I can find nothing distinctive about them. The head, pharynx and tooth are typical of the genus, the dorsal cirri have about 15–20 articles and the bristles are bidentate. They may well be young examples of *S. variegata*.

Syllis (*Haplosyllis*) *spongicola* Grube.

Fauvel, 1923, p. 257, fig. 95 *a–d*; and 1932, p. 76.

Occurrence :

St. M.B. Id, Red Sea, 26 m. (5).

St. 10, Red Sea, 55 m. (1).

St. 24, Gulf of Aden, 73–200 m. (1).

St. 27, Gulf of Aden, 37–91 m. (3).

St. 53, South Arabian Coast, 13·5 m., from fenestra of a Polyzoan *Retepora* (1).

St. 112, Zanzibar, 113 m. (2).

Distribution.—Atlantic, Mediterranean, Pacific, Indian Ocean.

Remarks.—The specimens from St. M.B. Id and St. 112 show certain unusual features. In all the body is massive anteriorly and very much arched. An average measurement is about 20 mm. in length. The dorsal cirri in the anterior region are very long, the longer cirri having about 40 articles. Otherwise in the structure of the feet, the bristles, the pharynx, etc., I can find no ground for separation. Fauvel (1933, p. 50) has described a *Syllis* (*Haplosyllis*) *depressa* Augener var. *dollfusi* from the Red Sea, which is also very highly arched dorsally but the bristles are quite different.

Syllis (*Ehlersia*) *cornuta* Rathke.

Fauvel, 1923, p. 267, fig. 100 *g–i*; and 1930, p. 14.

Occurrence :

St. 53, South Arabian Coast, 13·5 m. (1 juv.).

St. 105B, Zanzibar, 238–293 m. (1).

St. 106, Zanzibar, 183–194 m. (1).

Distribution.—Atlantic, Mediterranean, Persian Gulf, Arabian Coast, Zanzibar.

Remarks.—These specimens show nothing noteworthy.

Genus *Trypanosyllis* Claparède.

Trypanosyllis zebra Grube.

Fauvel, 1923, p. 269, fig. 101 *a–e*; and 1932, p. 78.

Occurrence :

St. M.B. Id, Red Sea, 29 m. (1).

St. M.B. Ic, Red Sea, 26 m. (1).

St. 53, South Arabian Coast, 13·5 m. (2).

Distribution.—Atlantic, Mediterranean, Indian Ocean.

Remarks.—The bristles are clearly bidentate.

Genus *Parasphærosyllis* gen. nov.

Parasphærosyllis indica gen. et sp. nov.

Occurrence :

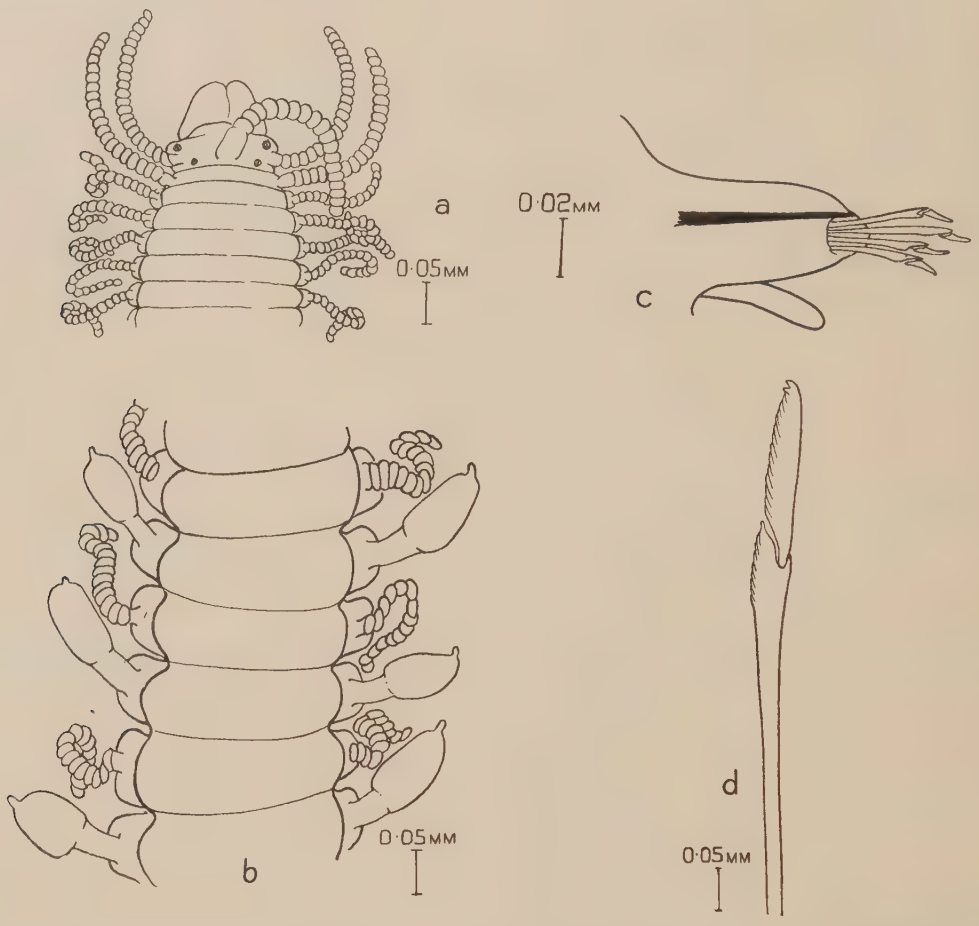
St. 53, South Arabian Coast, 13·5 m. (1).

Distribution.—Arabian Coast.

Description.—On the present inadequate material only a provisional account can

be given, and I feel that there is nothing to be gained by attempting a generic definition. The single specimen is a Syllid in the chain phase and has one stolon. The total measurement is 7 mm. in length, of which 2 mm. is occupied by the stolon. The breadth is about 0·5 mm. The total number of chætigers is 85, of which 20 belong to the stolon.

The body is slender and thread-like. There is no colour. The head (Text-fig. 8*a*) is rather broader than long with two pairs of eyes arranged in a trapeze. The palps are somewhat pointed and fused except at the extreme tip. The tentacles, tentacular cirri



TEXT-FIG. 8.—*Parasphærosyllis indica*. *a*, Anterior end from above. Ventral tentacular cirri not seen. *b*, Middle region from above. *c*, Middle foot from above; dorsal cirrus not shown. *d*, Bristle.

and the dorsal cirri of the first 15 chætigers are clearly moniliform and tightly coiled. The tentacles are about twice as long as the head and have about 20 articles. There is a dorsal pair of tentacular cirri which appear to be about the same size as the tentacles, but owing to the tight coiling their size is very difficult to estimate. There may be a pair of ventral tentacular cirri, but of this I am not sure. The pharynx is twisted and reaches back to the 9th chætiger; the proventriculus to the 16th. The ventriculus takes a turn forward through two segments before running backwards. There is a small triangular structure a little way behind the mouth of the pharynx, which I take to be a pharyngeal tooth, but I cannot see it clearly.

The first 15 chætigers have long, slender moniliform dorsal cirri with about 15 articles. At the 16th chætiger the dorsal cirrus is a large bulbous fusiform structure with a small terminal knob. This organ shows no trace of articulation, and the main bulbous stem has a reticular appearance under the microscope. From the 16th chætiger to the end of the stock these bulbous, fusiform cirri occur alternately with the slender moniliform cirri (Text-fig. 8*b*). They are also continued on to the stolon, but I am not sure that here they have an alternate arrangement. The stolon is somewhat damaged and most of the cirri are lost, and I can find bulbous cirri only on the 1st, 4th and 10th chætigers. On a number of the remaining segments slender, moniliform cirri are present.

The feet (Text-fig. 8*c*) are conical and there is a small subulate ventral cirrus. Each foot carries about half a dozen bristles (Text-fig. 8*d*), which are slender and have straight end-pieces faintly bidentate at the tip. The form of the bristles does not appear to alter throughout the body.

The beginning of the stolon is marked by 2 pairs of eyes, each pair being situated at the outer edge of the dorsal surface of the segment. The body ends in a pair of moniliform anal cirri.

Remarks.—The fusion of the palps places this species among the *Exogoninæ*, and the bulbous cirri would seem to have affinities with those of *Sphærosyllis*, but I know no Syllid which has this curious alternation of bulbous and slender moniliform dorsal cirri.

Family Nereidæ.

Genus *Nereis* Cuvier.

Nereis jacksoni Kinberg.

Fauvel, 1932, p. 97, with synonymy.

Occurrence :

St. M.B. Ib, Red Sea, 29 m. (3).

St. M.B. Id, Red Sea, 26 m. (17).

St. 53, South Arabian Coast, 13·5 m. (1).

Distribution.—Pacific, Indian Ocean, Australia, New Zealand.

Remarks.—These are all very small specimens, the larger measuring between 20 and 25 mm. by 1 mm. for 60–70 chætigers. They are recognizable by the presence in the middle and posterior feet of large bi- or tridentate homogomph falcigers. With Augener I am unable in the majority of examples to find paragnaths on the oral ring.

Nereis zonata Malmgren var. *persica* Fauvel.

Fauvel, 1932, p. 96.

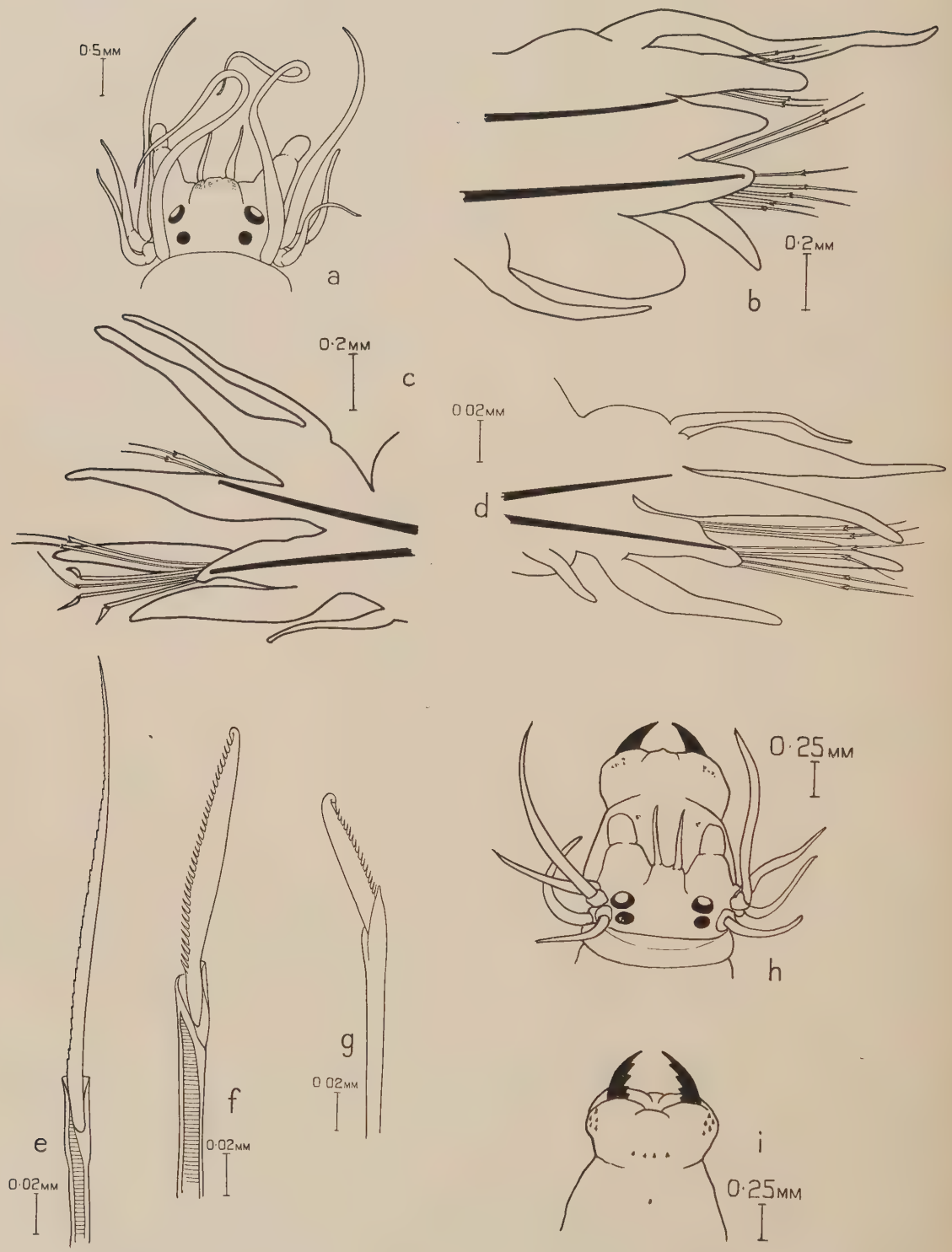
Occurrence :

St. 45, South Arabian Coast, 38 m. (2).

Distribution.—Red Sea, Persian Gulf, India, Arabian Coast.

Remarks.—One of these specimens has the proboscis everted and shows the typical arrangement of paragnaths. There are both bi- and tridentate homogomph falcigers in the hinder region.

TEXT-FIG. 9.


0·5MM
a
0·2MM
b
0·2MM
c
0·02MM
d
e
0·02MM
f
0·02MM
g
0·02MM
0·25MM
h
i
0·25MM

Nereis longilingulis n. sp.

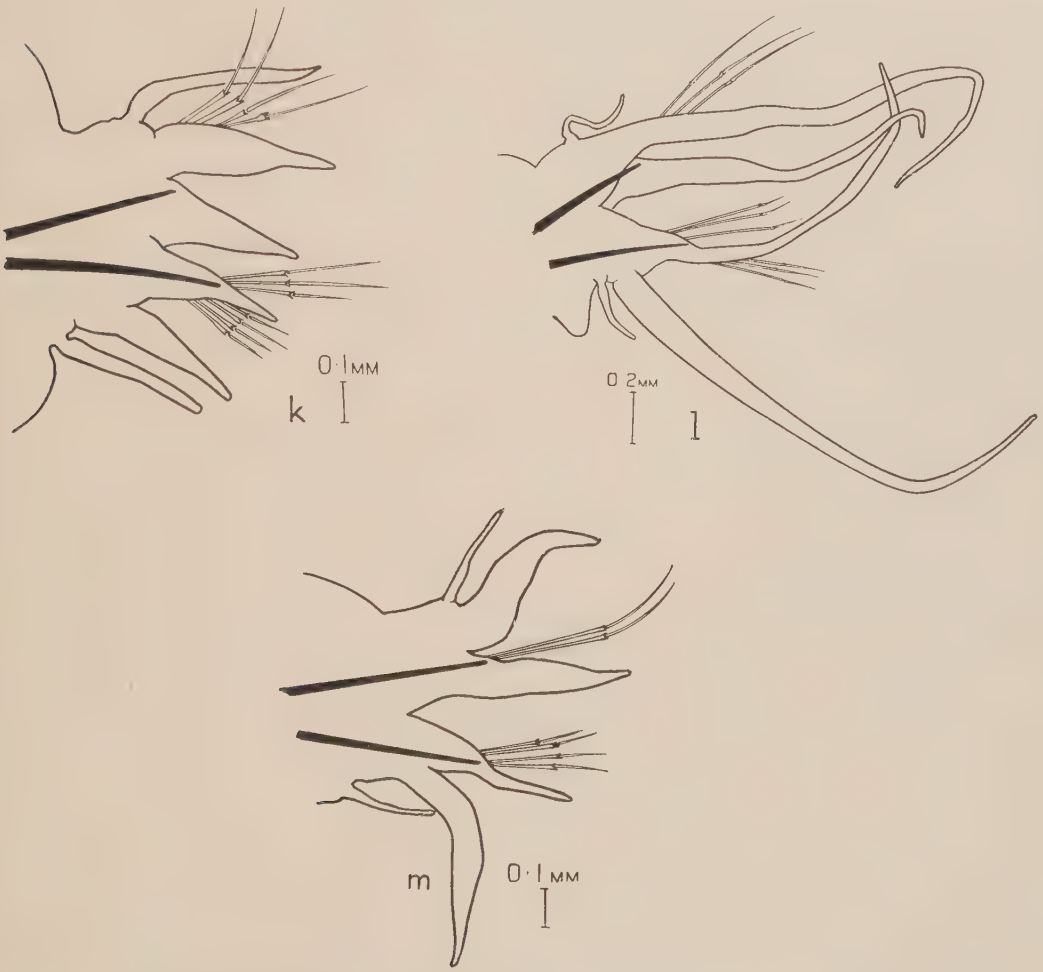
Occurrence :

St. 89, North Arabian Sea, 135–183 m. (8).

Distribution.—Arabian Sea.

Description.—These specimens fall into two distinct groups separable superficially on size, and although I believe that the smaller specimens represent a stage in the growth

Text-fig. 9—*continued.*



Text-fig. 9.—*Nereis longilingulis*. *a*, Head of larger form from above. *b*, 5th foot of larger form. *c*, 20th foot of larger form. *d*, 40th foot of larger form. *e*, Dorsal homogomph spiniger from larger form. *f*, Ventral hemigomph falciger from middle region of larger form. *g*, Ventral heterogomph falciger from hinder region of larger form. *h*, Head of smaller form from above. *i*, Ventral view of proboscis of smaller form. *k*, 5th foot of smaller form. *l*, 20th foot of smaller form. *m*, 70th foot of smaller form.

of the larger, the differences are so marked that I propose to describe the two groups separately.

In the group containing the larger specimens there is one complete example measuring about 45 mm. by 2 mm. at the widest part for 77 chætigers. The specimen is very much coiled so that an exact measurement is impracticable. The body is much tapered behind

and in spirit there are no colour-markings. The head (Text-fig. 9*a*) is longer than broad, not incised between the tentacles. The palps have stout palpophores and short clavate styles. Palps and tentacles about equal in length. There are 2 pairs of eyes with lenses. The longest tentacular cirrus reaches back to the 10th chætiger. The buccal segment is rather long. One specimen has the proboscis everted. The jaws are pale, and have the inner edges finely serrated. I can find no trace of paragnaths at all.

The feet vary according to their position in the body. At the 5th foot (Text-fig. 9*b*) there is a slender dorsal cirrus about twice as long as the narrow digitiform upper dorsal languet. The latter extends as far as the articulation of the bristles. There is a lower dorsal languet a little shorter and stouter than the upper. In the ventral ramus the anterior lip of the chæta-sac supported by a single black aciculum forms a conical process about as long as the lower dorsal languet, and the base of the hinder lip of the chæta-sac is carried out into a long, digitiform process similar to the upper dorsal languet. There is a stout, conical ventral languet and a slender ventral cirrus about as long as this. At the 10th foot there is little change except that the languets are relatively more slender. At the 20th foot (Text-fig. 9*c*) the upper dorsal languet is about as long as the dorsal cirrus and all the languets are much longer, thinner and more flagelliform. This does not apply to the anterior lip of the chæta-sac containing the aciculum, which shows no increase. There is at the same time a slight but steady decrease in length of the dorsal cirrus from before backwards.

At the 40th foot (Text-fig. 9*d*) the languets are still more elongate, and the dorsal cirrus is only about two-thirds of the length of the upper dorsal languet. At the 70th foot the languets are still very slender but considerably shorter, and the dorsal cirrus is about equal to the upper dorsal languet. The two rami are each supported by a single black aciculum throughout.

As regards the bristles, the dorsal ramus has only homogomph spinigers (Text-fig. 9*e*). The upper ventral bundle consists of homogomph spinigers and homogomph or hemigomph falcigers; the lower ventral bundle has homogomph spinigers and homogomph and hemigomph falcigers. These last (Text-fig 9*f*) have very long and slender ciliated blades and curved tips attached to the blades by short ligaments. In the hinder region the lower ventral bundle has a few rather larger heterogomph falcigers with relatively short blades (Text-fig. 9*g*). There is a short conical anus and a pair of rather small anal cirri, very possibly broken off short.

In the second group of specimens there is one complete example. It measures about 30 mm. by 1 mm. at the widest part for 80 chætigers. The body is dorsally banded with brown in the anterior region. The head (Text-fig. 9*h*) is rather long and narrow, not incised between the tentacles. There are 2 pairs of eyes without lenses arranged in a rectangle. The tentacles equal the palps in length. The longest tentacular cirri reach back to the 15th chætiger. The buccal segment equals in length the first 2 chætigers. On the proboscis (Text-fig. 9*i*) the arrangement of the paragnaths is as follows: I, *nil*; II, small crescentic patches; III, a transverse row of 4 relatively large paragnaths; IV, small crescentic patches; V, *nil*; VI, a single small paragnath; VII, a single small paragnath; VIII, *nil*. Only one specimen has the proboscis everted, but in all the presence of paragnaths can be seen by dissection.

As in the larger specimens, the feet vary according to their position in the body. At the 5th foot (Text-fig. 9*k*) there is a dorsal cirrus about equal in length to the upper dorsal

languet. This is slender and more or less digitiform. The lower ventral languet is a little broader and shorter than the upper. In the ventral ramus the lip of the chæta-sac is prolonged into a slender process similar to the dorsal languets. There is a ventral languet also similar to the rest, and a long slender ventral cirrus a little shorter than the ventral languet. There is a rapid decrease in length of the dorsal cirrus from before backwards. By the 10th foot the languets have greatly increased in length, and the upper dorsal languet is more than twice as long as the dorsal cirrus. By the 20th chætiger (Text-fig. 9*l*) the languets are completely flagelliform and have reached an extraordinary length. The dorsal cirrus has much decreased. By the 40th foot there is little change. At the 70th chætiger (Text-fig. 9*m*) all the languets are slender but very much reduced in length.

The bristles in this group of specimens appear to be similar to those in the other. The dorsal ramus has homogomph spinigers only, and the ventral ramus has homogomph spinigers and homogomph, hemigomph, and in the hinder region heterogomph falcigers. The only complete specimen has a pair of long anal cirri.

Remarks.—Although these two groups of specimens, both taken in the same haul, show certain differences in the relative length of cirrus and languet and of the various languets, the fundamental form of the feet is the same. Moreover the form is very unusual. I therefore have no explanation to offer for the fact that no trace of paragnaths can be found in any of the four larger specimens and their presence easily detected in the smaller. That in the larger specimens they are simply lost I do not believe. It is possible that when the animal reaches a certain size the paragnaths are shed, but this is mere speculation. If confirmed, it would mean that the fully grown form would be attributable to *Leptonereis* and the young form to *Nereis*.

In the extreme elongation of the languets the species has certain affinities with *Nereis* (*Ceratonereis*) *flagellipes* Fauvel, but differs in a number of characters, notably in having one and not two flagelliform processes arising from the ventral chæta-sac and in having differently shaped blades to the falcigers.

Genus *Platynereis* Kinberg.

Platynereis pulchella Gravier.

Gravier, 1900, pl. xii, figs. 55, 56; and 1901, p. 202, text-figs. 210–213.
Platynereis dumerilii Audouin and Milne-Edwards, var. *pulchella*, Fauvel, 1911, p. 402, pl. xx, figs. 30–32.
Platynereis pestai Holly, 1935, p. 27, pl. i, figs. *j*, *k*, and text-figs. 13–15.
Platynereis pulchella Monro, 1936a, p. 380, figs. 1–3.

Occurrence :

St. M.B. IIa, South Arabian Coast, 11 m. (7 atocous and 1 semi-epitocous).
St. Extra, East side of Ras Madraka, South Arabian Coast, shore collection (4 atocous).
St. 18, Gulf of Aden, 900–0 m. (1 atocous).
St. 22, Central Arabian Sea, from Sargasso weed (2 atocous).
St. 25, Gulf of Aden, from Sargasso weed (7 atocous and 1 epitocous).
St. 27, Gulf of Aden, 37–91 m. (1 atocous).
St. 41, South Arabian Coast, surface (2 atocous).
St. 44, South Arabian Coast, surface (14 atocous).

Distribution.—Red Sea, Persian Gulf, Gulf of Aden, Arabian Coast, Hawaii ?.

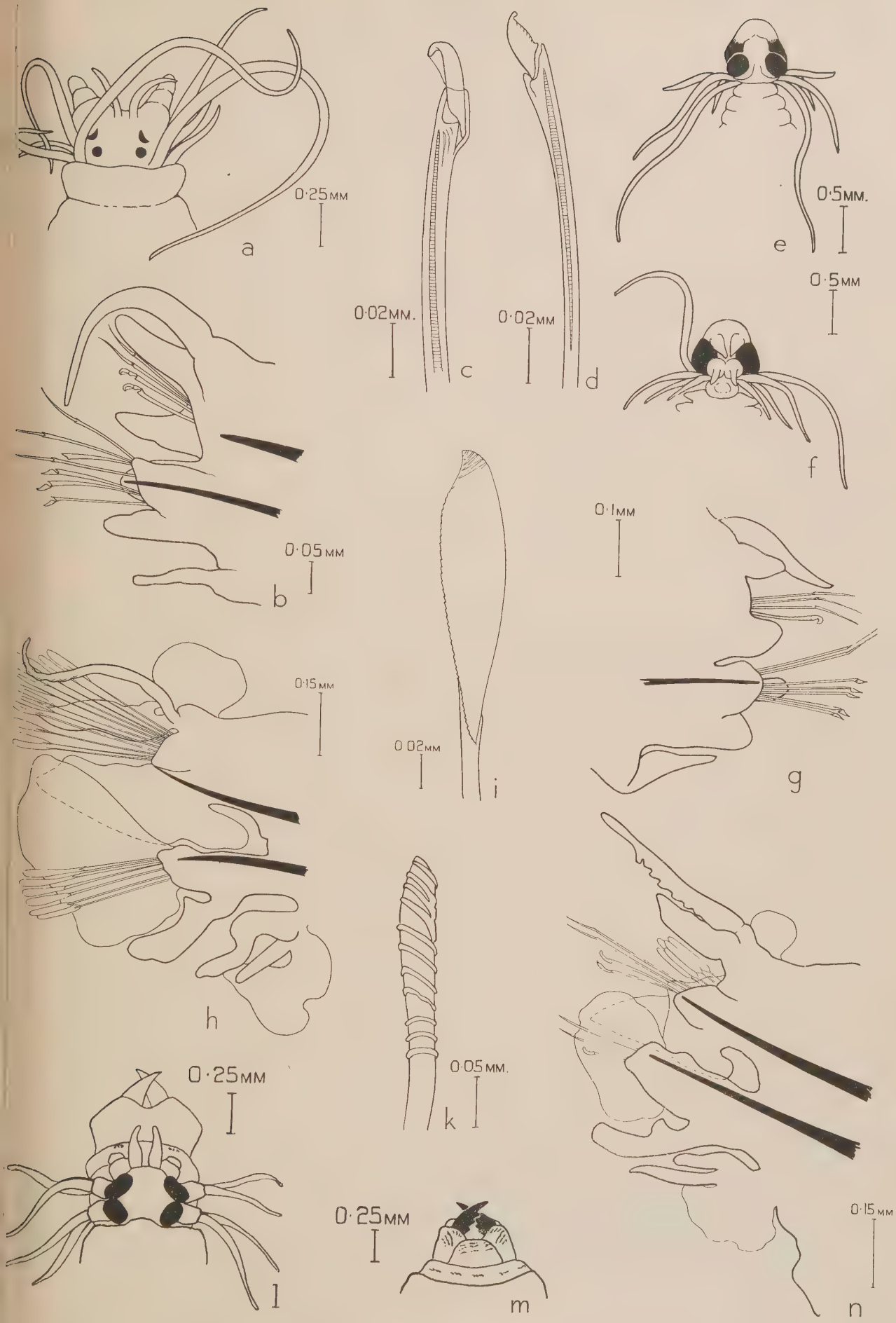
Remarks.—There are one epitocous male, one semi-epitocous and a number of atocous specimens. The average size of the atocous examples is about 20 mm. by 2 mm. for about 70 chætigers. The head (Text-fig. 10*a*) is broader than long and the palps slender. There are 2 pairs of eyes. The tentacles are as long as the palps. The hindmost tentacular cirrus reaches back to the 12th chætiger. The buccal segment is long and forms a kind of neck, where the body narrows in front. The proboscis is partly everted in one specimen only, the semi-epitocous male from St. M.B. II. The arrangement of the paragnaths is as follows : I and II, *nil* ; III, a small, rounded patch ; IV, curved, pectinate clusters ; V, *nil* ; VI, an elongate pectinate cluster ; VII and VIII, about 5 small patches of pectinæ.

The feet (Text-fig. 10*b*) consist of the usual dorsal and ventral rami. The dorsal ramus has a cirrus and 2 narrow, equal, conical languets ; the dorsal cirrus is rather more than twice as long as the upper dorsal languet. The ventral ramus has a prominent, 2-lipped chætal lobe, a ventral languet similar to the dorsal and a slender, ventral cirrus slightly shorter than the ventral languet. Both rami are supported by large, colourless acicula. The dorsal ramus carries a number of slender homogomph spinigers, and below these 1 to 4 homogomph falcigers (Text-fig. 10*c*) with downwardly curved tips, and conspicuous terminal ligaments having their basal attachment as far down as the lip of the articular cup. In many specimens these dorsal homogomph falcigers are present in the most anterior segments and in all they appear before the 20th chætiger. They are present in the anterior unmodified region of the male heteronereid from St. 25. The upper ventral ramus carries heterogomph spinigers and heterogomph falcigers ; the lower ventral ramus also carries heterogomph spinigers and heterogomph falcigers (Text-fig. 10*d*). In the hinder region there is no change in the structure of the feet, but I see no spinigers in the lower ventral bundle. The body ends in a pair of long pygidial cirri.

The male heteronereid measures about 10 mm. by 1 mm. for about 75 chætigers. It bears a strong resemblance to *Platynereis polyscalma* Chamberlin. In both the head turns over on to the ventral surface. Both have the first 14 chætigers unmodified ; the arrangement of the pedal languets in both the unmodified and modified region is similar in both species ; both have fringed swimming-bristles and simple bristles with ribbed blades in the hinder region. There are, however, a number of clear points in which they differ, for I have compared the specimen with two examples of *P. polyscalma* from Indo-china very kindly lent me by Prof. Fauvel. As far as can be seen from the small quantity of material, the body in *polyscalma* is more slender and elongate than in *pulchella*. The head (Text-fig. 10*e* and *f*) in *pulchella* is very little longer than broad and therefore relatively much shorter than in *polyscalma*, and this is due to the comparatively slight development of the preocular snout. The eyes have a similar position in both species,

Text-fig. 10.—*Platynereis pulchella* Gravier. *a*, Head from above (atocous). *b*, Middle foot (atocous). *c*, Dorsal homogomph falciger from anterior region (atocous). *d*, Ventral heterogomph falciger from middle region (atocous). *e*, Dorsal view of head (epitocous). *f*, Ventral view of head (epitocous). *g*, Anterior unmodified foot (epitocous). *h*, Foot from middle region (epitocous). *i*, Swimming-bristle (epitocous). *k*, Simple ribbed bristle from terminal segments (epitocous). *l*, Head from above (semi-epitocous). *m*, Ventral view of proboscis (semi-epitocous). *n*, Foot from middle region (semi-epitocous).

TEXT-FIG. 10.


0·25MM
a
0·02MM.
c
0·02MM
d
0·5MM.
e
0·5MM
f
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b
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g
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h
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k
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l
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m
0·15MM
n

but in *pulchella* the pale lenticular patches in the middle are absent. Again in *pulchella* the curious dorsal homogomph falciger found in the atocous form is present in the anterior unmodified region (Text-fig. 10*g*), and this bristle is absent in *polyscalma*. The fringes of the swimming-bristles in *polyscalma* are very coarse and easy to distinguish even at a low magnification; in *pulchella* (Text-fig. 10*h* and *i*) they are very fine and difficult to see, and the terminal, simple, ribbed bristles (Text-fig. 10*k*) are finer in *pulchella*. Finally the tentacles in *pulchella* are conical and not cirriform as in *polyscalma* and the tentacular cirri are relatively much longer, the longest reaching back as far as the 12th chætiger. The pygidium in my specimen is destroyed and therefore not available for comparison.

In the semi-epitocous specimen the eyes are greatly enlarged, and though the prostomium is much distorted by the eversion of the proboscis (Text-fig. 10*l* and *m*), it can be seen that the palps and tentacles are turned downwards. This specimen is clearly conspecific with the atocous specimens, and a careful comparison with the male heteronereid has convinced me that this also is of the same species. In both the first 14 chætigers are unmodified, both have the homogomph falciger in the dorsal ramus, in both the dorsal cirri of the first 7 chætigers show a similar change. In both the modified epitocous feet (Text-fig. 10*n*) are similar. In the semi-epitocous male the swimming-bristles are just beginning to appear in the dorsal ramus only, and traces of the fringe of teeth can with difficulty be made out. Unfortunately the specimen is incomplete posteriorly, so that I cannot look for simple ribbed bristles in the terminal segments.

In the atocous phase this species is very close to *P. dumerilii*. Fauvel (*loc. cit.*) has described it as "*tout au plus, une simple variété de* P. dumerilii", and says that it differs from *P. dumerilii* in having slightly shorter tentacular cirri, a single row of paragnaths in Group VI, the pedal glands more or less fused into a bilobed mass, and finally in having a rather more massive and curved type of dorsal homogomph falciger. Actually in *P. dumerilii* the head of the bristle is notched and the ligament attached basally at a point distal to the edge of the articular cup, whereas in *pulchella* the tip of these bristles curves over quite smoothly and the basal attachment of the terminal ligament is made at the edge of the articular cup.

Although in their atocous phase *P. dumerilii* and *P. pulchella* are very close and even difficult to separate, the heteronereids of the two species are quite different, and it is interesting to find such marked differences in the sexual phase of two forms so very similar in their asexual condition.

I am of the opinion that the heteronereids described by Holly (*loc. cit.*) as *Platynereis pestai* from Hawaii are also the epitocous form of Gravier's *P. pulchella*.

Genus *Ceratonereis* Kinberg.

Ceratonereis mirabilis Kinberg.

Fauvel, 1932, p. 98.

Occurrence:

St. 27, Gulf of Aden, 37–91 m. (1).

St. 141, Maldives, 44 m. (2).

Distribution.—West Indies, Indian Ocean, Australia, New Zealand, Maldives.

Genus *Leonnates* Kinberg.

Leonnates jousseaumei Gravier.

Fauvel, 1932, p. 85.

Occurrence :

St. M.B. Ib, Red Sea, 29 m. (3).

St. M.B. Id, Red Sea, 26 m. (4).

Distribution.—Red Sea, Persian Gulf, Bay of Bengal, Arabian Sea.

Remarks.—These are all small, fragmentary specimens.

Family Nephthydidæ.

Genus *Nephthys* Cuvier.

Nephthys dibranchis Grube.

Fauvel, 1932, p. 117, with citations

Occurrence :

St. 28, Gulf of Aden, 201 m. (1).

St. 70, Gulf of Oman, 196 m. (1).

St. 139, Maldives, 51 m. (1).

St. 179B, Gulf of Aden, 275 m. (1).

St. 190, Gulf of Aden, 183 m. (6).

St. 191, Gulf of Aden, 274 m. (6).

St. 207, Red Sea, 375 m. (1).

Distribution.—Indian Ocean, New Zealand, Australia, South America.

Remarks.—This is a common species in this area. I have counted the rows of papillæ on those specimens that have the proboscis everted, and the number is constantly 22.

Nephthys inermis Ehlers.

Fauvel, 1923, p. 375, fig. 147 *a–f*; and 1933, p. 47, fig. 3 *a–d*.

Occurrence :

St. 80, South Arabian Coast, 16–22 m. (5).

St. 164, Maldives, 183 m. (1).

St. 178, Gulf of Aden, 91 m. (1).

Distribution.—Atlantic, Gulf of Mexico, Gulf of Suez, South Arabian Coast, Maldives, Gulf of Aden.

Remarks.—Fauvel (*loc. cit.*, 1933) records this species from the Red Sea. Moreover, I find far back in the pharynx a pair of narrowly oblong, transverse, chitinous plates which I take to be the jaws mentioned by him, and which Ehlers failed to find. The hinder pair of minute tentacles I find more laterally situated than Fauvel figures them. In specimens with the proboscis withdrawn they lie at the lateral edges of the prostomium, a little way in front of the eyes.

Family Glyceridæ.

Genus *Glycera* Savigny.

Glycera rouxii Audouin and Milne-Edwards.

Fauvel, 1923, p. 389, fig. 153 *a–c*; and 1932, p. 128.

Occurrence :

St. 72, Gulf of Oman, 73 m. (2).
St. 137, Maldives, 46 m. (1).
St. 142B, Maldives, 37 m. (1).
St. 144, Maldives, 31 m. (1).
St. 160, Maldives, 37 m. (4).

Distribution.—Atlantic, Mediterranean, Indian Ocean, Japan.

Remarks.—This is a common and very widely distributed species. The posterior lobes of the feet are subequal in the anterior region, the lower being shorter and blunter than the upper. In the hinder region the difference between the two lobes increases. There is a single, cirriform, retractile branchia on the anterior face of the feet.

Glycera subœnea Grube.

Fauvel, 1919, p. 425, pl. xvi, figs. 48–51.

Occurrence :

St. 180, Gulf of Aden, 397 m. (1).

Distribution.—Philippines, Madagascar, Gulf of Aden.

Remarks.—The specimen has 3–4 branched retractile gills issuing from the anterior face of the foot.

Glycera lancadivæ Schmarda.

Willey, 1905, p. 286, pl. v, figs. 113–116.
Fauvel, 1932, p. 125.

Occurrence :

St. 45, South Arabian Coast, 38 m. (2).

Distribution.—Ceylon, Maldives, Laccadives, Arabian Coast.

Remarks.—Two anterior fragments. The foot has a single posterior lobe, slightly emarginate in the middle. There are no branchiæ.

Genus *Goniada* Audouin and Milne-Edwards.

Goniada multidentata Arwidsson var. *indica* var. nov.

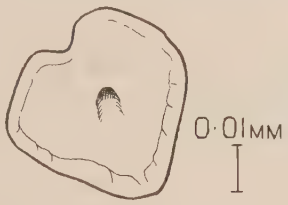
Occurrence :

St. 16, Gulf of Aden, 186 m. (1).

Distribution.—West Africa, Gulf of Aden.

Description.—The specimen is an anterior fragment measuring 25 mm. by 2 mm. without the feet for 69 chætigers. The pharynx carries about 45 chevrons on each side, and on the partly everted proboscis they extend from a point about a third of the way down the prostomium to the 16th chætiger. The macrognaths have 6 teeth, and there

are about 26 micrognaths arranged in two irregular rows of larger and smaller plates. The change from the uniramous to the biramous condition begins at the 36th chætiger and is complete at the 43rd, where the true hinder region begins. The dorsal bristles are acicular. The feet are as figured by Arwidsson (1899, p. 45, pl. iii, figs. 40–42, and pl. iv, fig. 63) for the stem-form. The present variety differs from the African form in having the armature of the proboscis more or less reduced by a half. Arwidsson gives



Text-fig. 11.—*Goniada multidentata* Arwidsson var. *indica* var. nov. Papilla from proboscis.

90 chevrons, 12 teeth to the macrognaths and roughly 4 rows of micrognaths—double the number throughout of those in the present form.

The papillæ on the proboscis (Text-fig. 11) are cordiform with a central canal.

Goniada eximia Ehlers.

Ehlers, 1901, p. 157, pl. xx, figs. 7–17.
Monro, 1936, p. 141, fig. 25 *a–j*.

Occurrence :

St. 85, North Arabian Sea, 1519–1705 m. (1).

Distribution.—Magellan, Falkland Islands, Arabian Sea.

Remarks.—The single specimen is complete, and measures about 250 mm. by 4 mm. without the feet for 252 chætigers. There are 18 pairs of chevrons, and this confirms Ehlers's contention that chevrons are present in young specimens. The macrognaths have 5 teeth, and there are about 30 micrognaths arranged in two irregular rows of larger and smaller plates. The change from the uniramous to the biramous condition begins at the 58th chætiger and is complete at the 96th where the true hinder region begins. The feet are as figured by Ehlers and myself. The dorsal bristles are capillary. The papillæ on the proboscis are more or less kidney-shaped with a central canal.

It is interesting to find this Magellan region species below the 1500-m. line in the Indian Ocean. One would like to know whether it grows in the tropics to the gigantic size to which it attains in the temperate zone.

Goniada longicirrata (?) Arwidsson.

Arwidsson, 1899, p. 47, pl. iii, figs. 43, 44.

Occurrence :

St. 80, South Arabian Coast, 16–22 m. (1).

St. 206, Red Sea, 256 m. (1).

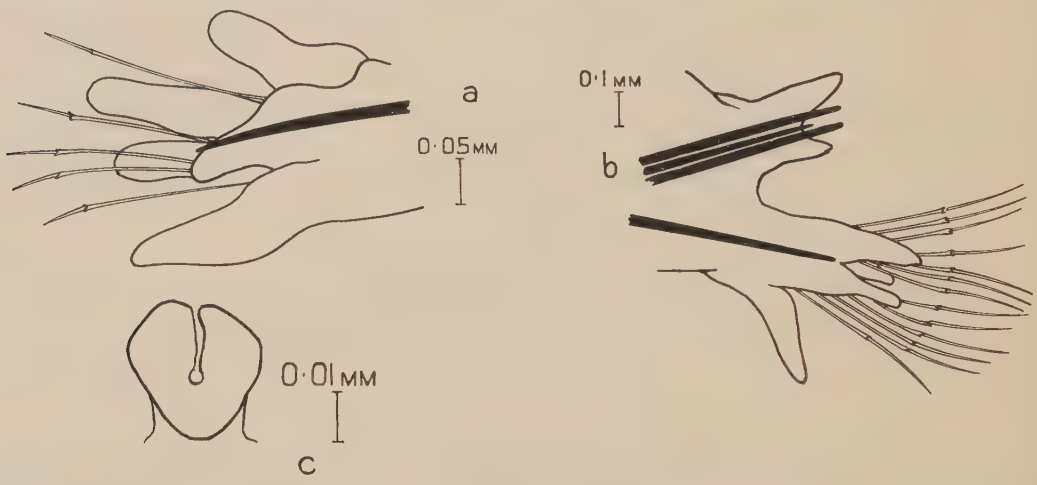
Distribution.—West Africa, Red Sea, South Arabian Coast.

Remarks.—The specimen from St. 206 is complete, and measures 40 mm. by 1 mm. without the feet for 145 chætigers. There are between 12 and 18 pairs of chevrons. There is the usual ring of paragnaths in the proboscis. The macrognaths have 3 teeth, and

there are about 22 micrognaths arranged in 2 irregular rows of larger and smaller plates. The change from the uniramous (Text-fig. 12*a*) to the biramous (Text-fig. 12*b*) condition of the feet takes place at the 58th chætiger and there is no intermediate region.

The feet are of the usual shape, with a ventral ramus having 2 anterior and a single posterior lobe. They closely resemble those of *G. emerita*, and do not show the elongation of the dorsal cirrus described and figured by Arwidsson. The papillæ (Text-fig. 12*c*) of the proboscis are roughly triangular in outline, and have a passage running up from the exterior to the central canal.

These specimens are very doubtfully attributed to Arwidsson's species. Arwidsson's description was based on a specimen in bad condition and he could find neither chevrons nor dorsal paragnaths, both of which are present in these examples. Moreover there is no



TEXT-FIG. 12.—*Goniada longicirrata* Arwidsson. *a*, Foot from anterior region. *b*, Foot from hinder region. *c*, Papilla from proboscis.

elongation of the dorsal cirrus such as Arwidsson describes. My specimens agree, however, with Arwidsson's in the place of origin of the biramous region. They may belong to *G. emerita*, but the biramous region begins a little further forward than is normally found in *G. emerita*, and the number of the teeth (3) of the macrognaths is low for that species.

Family EUNICIDÆ.

Genus *Eunice* Cuvier.

Eunice indica Kinberg.

Crossland, 1904, p. 318, pl. xxi, figs. 9–12, and text-figs. 61–64.
Fauvel, 1932, p. 139.

OCCURRENCE :

St. 45, South Arabian Coast, 38 m. (1).
St. 53, South Arabian Coast, 13·5 m. (2).
St. 75, Gulf of Oman, 201 m. (1).
St. 144, Maldives, 31 m. (2 juv.).

DISTRIBUTION.—Red Sea, Indian Ocean, Japan, New Caledonia.

Remarks.—The most easily appreciable difference between this species and the similar *E. australis* is the prolongation of the guard of the compound bristles into a kind of spike. The absence of annulation of the tentacles is deceptive, for the larger specimen from St. 53 has the tentacles much contracted, which gives them the appearance of annulation, and in young specimens of *E. australis* the annulation of the tentacles is often not obvious.

Eunice australis Quatrefages.

Eunice murrayi McIntosh, Crossland, 1904, p. 310.
Eunice australis Fauvel, 1917, p. 228, text-fig. 21; and 1932, p. 139.

Occurrence:

St. M.B. Id, Red Sea, 26 m. (12).
St. 10, Red Sea, 55 m. (8).
St. 27, Gulf of Aden, 37–91 m. (1).
St. 43, South Arabian Coast, 83–100 m. (1).
St. 45, South Arabian Coast, 38 m. (12).
St. 53, South Arabian Coast, 13·5 m. (7).

Distribution.—Indian Ocean, South Africa, Australia, New Zealand.

Remarks.—This is the commonest Eunicid in the present collection. Many of the specimens are young, and measure 12–15 mm. in length for about 70 chætigers. The specimens from St. 10 are uniformly dark red in colour, and I take this to be due to some extraneous staining.

Eunice antennata Savigny.

Crossland, 1904, p. 312, pl. xxii, figs. 1–7, and text-figs. 56–60.
Fauvel, 1932, p. 138.

Occurrence:

St. M.B. Ib, Red Sea, 29 m. (2).

Distribution.—Red Sea, Indian Ocean, Pacific.

Remarks.—In both these specimens the gills are reduced to a single filament in the middle region and increase to 3 filaments posteriorly.

Eunice tentaculata Quatrefages.

Fauvel, 1917, p. 209, text-fig. 17; and 1932, p. 134.

Occurrence:

St. 45, South Arabian Coast, 38 m. (4).

Distribution.—Indian Ocean, Australia, New Zealand.

Remarks.—Four anterior and one posterior fragments. All have the white collar on the 4th chætiger. The gills begin on the 3rd foot, and in the largest specimen already have 5 filaments. The maximum number of filaments is 20–23. The white collar and the annulation of the tentacles are the only means of distinguishing this species from examples of *E. aphroditois* of similar size, and it does not seem to me certain that the two species are distinct. Furthermore this species is doubtfully separable from *E. torquata* Quatrefages.

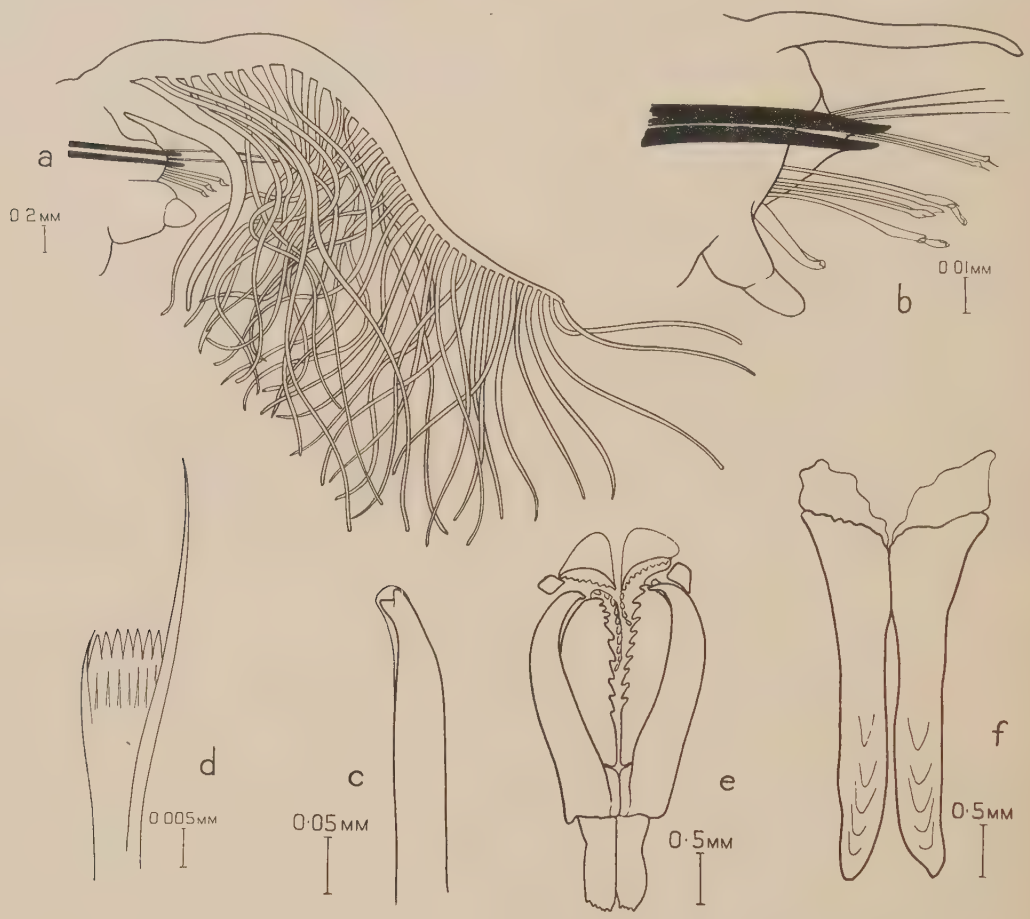
Eunice validobranchiata n. sp.

Occurrence :

St. 54, South Arabian Coast, 1046 m. (5).

Distribution.—South Arabian Coast.

Description.—Colour in spirit pale green, with a dark green stripe running down the mid-ventral line. The longest, apparently almost complete fragment measures 82 mm.



Text-fig. 13.—*Eunice validobranchiata*. *a*, 10th foot. *b*, Foot from hinder region. *c*, Sub-acicular hook. *d*, Comb-chæta. *e*, Upper jaws. *f*, Lower jaws.

by 4 mm. for 102 chætigers : three fragments which I believe together to have constituted a single individual have a total measurement of 88 mm. by 5 mm. at the widest part for 135 chætigers. The largest individuals are represented by fragments measuring 6 mm. in width at the widest part without the feet.

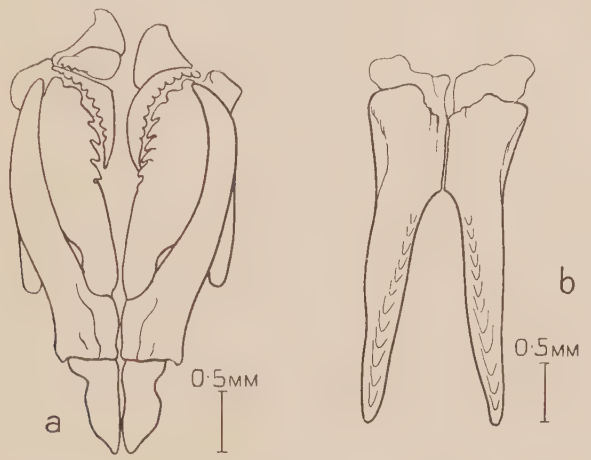
The palps are bilobed. The tentacles and tentacular cirri are smooth. The median tentacle reaches back to about the 10th chætiger and the laterals are a little shorter than this. The buccal segment is twice as long as that which follows.

The gills form a dense and conspicuous cluster over the dorsal surface of the anterior region. They begin on the 3rd chætiger and cease between the 45th and 50th. They are already highly pectinate at the 3rd chætiger, and in one specimen the 1st gill has 17 filaments. They show their greatest development between the 5th and 25th chætigers

(Text-fig. 13*a*), and in the larger specimens have a maximum of no less than 40–45 filaments. The individual filaments vary in length, but a number in each gill are about two-thirds as long as the rachis.

The dorsal cirri are long and slender, and the ventral are the usual conical processes surmounting the glandular pads except in the first 5–6 chætigers and in the hinder region (Text-fig. 13*b*), where they are digitiform. The feet are supported by 2 or 3 yellow acicula with curved tips. The subacicular hook (Text-fig. 13*c*) is yellow and bidentate and begins at about the 40th chætiger. The guard of the compound bristles is continued to a point beyond the end of the hook. This is much more marked in some specimens than in others. The comb-chætæ (Text-fig. 13*d*) have one side prolonged and 8 to 12 teeth. The jaws (Text-fig. 13*e* and *f*) are as figured. The dental formula is 9–10 : 10 + 7–12.

Remarks.—In the distribution of the gills and in the possession of bidentate yellow subacicular hooks this species agrees with *E. savignyi* Grube, but is distinguished by the extraordinary development of the gills with their very long filaments. In fact for their size these specimens have much more highly developed gills than any *Eunice* that I know.



Text-fig. 14.—*Eunice investigatoris* Fauvel. *a*, Upper jaws. *b*, Lower jaws.

Eunice investigatoris Fauvel.

Fauvel, 1932, p. 137, text-fig. 19 *a–f*.

Occurrence :

St. 54, South Arabian Coast, 1046 m. (9).

Distribution.—Persian Gulf, South Arabian Coast.

Remarks.—There are 9 anterior and several posterior fragments. That belonging to the largest individual has a width of 7 mm. at the widest part without the feet. In their general appearance they bear a striking resemblance to the specimens of *E. validobranchiata*, together with which they were taken. They agree very well with Fauvel's account, the ramified gills in the hinder region having a highly characteristic appearance.

The gills all begin on the 6th chætiger, and in the largest specimen at the 18th chætiger have about 25 filaments apart from secondary ramifications. Fauvel gives the 44th–45th feet as the point of origin of the subacicular hook. I find them beginning rather further forward, usually at about the 35th chætiger. Fauvel's material was inadequate for the investigation of the jaws (Text-fig. 14*a* and *b*), which I figure. The dental formula is 6–7 : 8 + 3–9.

Genus *Marphysa* Quatrefages.

Marphysa simplex Crossland.

Crossland, 1903, p. 140, pl. xv, figs. 11, 12, text-figs. 13, 14.

Occurrence :

St. 104, Zanzibar, 207 m. (1).

Distribution.—Zanzibar.

Remarks.—The specimen is incomplete, and measures 48 mm. by 5 mm. for 92 chætigers. The prostomium is only slightly notched in front, less so than in Crossland's specimens, and a median dorsal groove is barely indicated. There are no eyes, wherein it differs from the types. The tentacles are a little less than twice as long as the head. The body is more or less rounded throughout and shows little flattening. The gills begin on the 43rd chætiger and show a maximum of 3 filaments. The brown, simple-pointed, subacicular chæta appears at the 65th chætiger. The compound bristles have cultriform blades only. The acicula are dark brown, and the comb-bristles have long lateral teeth.

This species is close to *M. sanguinea*, but differs in having the body more or less rounded throughout and in having a different type of comb-bristle.

Genus *Lysidice* Savigny.

Lysidice collaris Grube.

Fauvel, 1932, p. 143, with synonymy.

Occurrence :

St. 157, Maldives, 229 m. (1).

Distribution.—Red Sea, Indian Ocean, Pacific, Japan, Australia.

Genus *Onuphis* Audouin and Milne-Edwards.

Onuphis furcatoseta n. sp.

Occurrence :

St. 16, Gulf of Aden, 186 m. (9).

St. 70, Gulf of Oman, 196 m. (1).

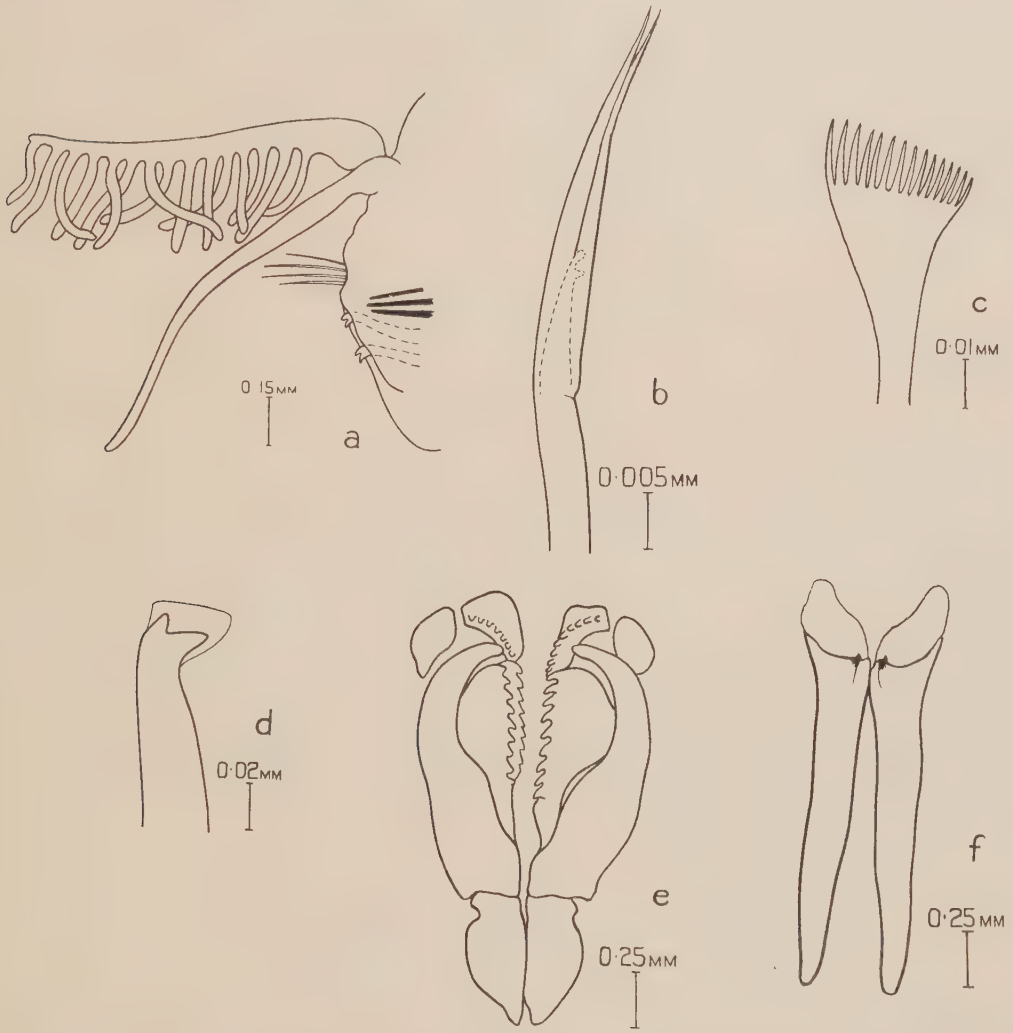
St. 75, Gulf of Oman, 201 m. (1).

St. 207, Red Sea, 375 m. (1).

Distribution.—Gulf of Aden, Gulf of Oman, Red Sea.

Description.—All the specimens are incomplete, and the largest measures 35 mm. by 3 mm. for about 85 chætigers. St. 16 yielded a large number of tubes formed of mud, and the specimens extracted from these are all in bad condition. Those freshly extracted from their tubes show a well-defined colour pattern. There is a brown streak running from the base of the median tentaculophore to the hinder limit of the head, and there are brown transverse segmental bands across the back in the anterior region. Between the inner and outer lateral tentacles there is on each side a small group of minute dots which I take to be ocular. In specimens from stations other than 16 the colour pattern has disappeared.

The body is cylindrical for the first few segments and then shows a flattening dorsally. The palps are globular and the frontal tentacles ovate. The occipital tentacles have short tentaculophores; the median and inner laterals reach back to about the 10th chætiger and the outer laterals are about a third of this length. The buccal segment carries a pair of tentacular cirri which reach back almost to the hinder border of the first chætiger. Dorsal cirri long, slender, subulate, about equal to the branchiæ in the middle



TEXT-FIG. 15.—*Onuphis furcatoseta*. *a*, Twelfth foot. *b*, Forked bristle. *c*, Comb-bristle. *d*, Subacicular hook. *e*, Upper jaws. *f*, Lower jaws.

region. Ventral cirri digitiform in front, disappearing at about the 10th chætiger. Posterior lip of the chæta-sac cirriform for the first 5 chætigers. The gills have a woolly appearance. They begin usually with two minute filaments at the 3rd chætiger, rapidly increase until they reach their maximum development (of about 18 filaments in one of the larger specimens) at about the 15th chætiger (Text-fig. 15*a*), and remain highly ramified probably to the end of the body. None of the specimens is complete, but they are still well developed at the 85th chætiger.

The first 3 chætigers have flattened capillary bristles, and the place of the usual

compound hooks is taken by curious simple or incipiently pseudo-compound bristles having a very slight and scarcely noticeable notch marking the place where the usual articulation is found, and very long hoods, the ends of which are prolonged into two tapering points which form a terminal fork (Text-fig. 15*b*). Inside the hood an ill-defined bidentate hook can with difficulty be seen, and there is no clear distinction discernible between the hood and the hook which it contains. The following chætigers have capillary bristles, and from the middle region onwards comb-bristles (Text-fig. 15*c*) with about 15 teeth. At the 9th chætiger there appears a pair of yellow hooded bidentate subacicular hooks (Text-fig. 15*d*).

I figure the jaws (Text-fig. 15, *e* and *f*). The dental formula is 9–9 : 8 + 7–9.

Remarks.—The curious anterior chætæ with forked tips and the highly ramified woolly gills are unlike those of any other *Onuphis* that I know.

Onuphis aucklandensis Augener.

Augener, 1924, p. 418, fig. 11 *a–e*.
Fauvel, 1932, p. 146.
Monro, 1936, p. 152.

Occurrence :

St. 190, Gulf of Aden, 183 m. (1).

Distribution.—New Zealand, India, Gulf of Aden.

Remarks.—The specimen is in two pieces, which together measure 28 mm. by 1 mm. for 77 chætigers. I take it to be a young example of Augener's species. The colour pattern is very conspicuous. There are reddish-brown spindle-shaped markings across the dorsal surface of every segment. They are more intense anteriorly but are continued to the end of the fragment. There are also dark brown patches below the feet. The gills begin with a single filament on the 2nd chætiger, are ramified by the 4th and show a maximum of 4 filaments. The pseudo-compound hooks are continued to the 5th chætiger as in my New Zealand specimens.

Onuphis eremita Audouin and Milne-Edwards.

Fauvel, 1923, p. 414, fig. 163 *a–l* ; and 1932, p. 146.

Occurrence :

St. 80, South Arabian Coast, 16–22 m. (3).

Distribution.—Atlantic, Mediterranean, Indian Ocean.

Remarks.—Three anterior fragments.

Onuphis sp.

Occurrence :

St. 118, Zanzibar, 1789 m. (numerous tubes).

Remarks.—A large number of parchmenty tubes, to many of which long sponge-spicules are attached. Nearly all are empty, and the few specimens that I have extracted are too badly preserved to be determinable. The anterior crochets are large, simple hooks resembling those of *O. conchylega*, to which species the specimens may very well belong.

Genus *Diopatra* Audouin and Milne-Edwards.

Diopatra neapolitana Delle Chiaje.

Fauvel, 1923, p. 419, fig. 166 *a–h*; and 1932, p. 144.

Occurrence :

St. 45, South Arabian Coast, 38 m. (2).
St. 72, Gulf of Oman, 73 m. (1).
St. 75, Gulf of Oman, 201 m. (1).

Distribution.—Atlantic, Mediterranean, Indian Ocean.

Remarks.—These are anterior fragments, and I can add nothing to Fauvel's careful study of this species.

Genus *Hyalinœcia* Malmgren.

Hyalinœcia tubicola (O. F. Müller).

Fauvel, 1923, p. 421, fig. 166 *i–q*; and 1932, p. 149.

Occurrence :

St. M.B. IIc, South Arabian Coast, 29 m. (4).
St. 33, Gulf of Aden, 1295 m. (3).
St. 54, South Arabian Coast, 1046 m. (1).
St. 62, North Arabian Sea, 1893 m. (4).
St. 85, North Arabian Sea, 1519–1705 m. (4).
St. 118, Zanzibar, 1789 m. (1).
St. 141, Maldives, 44 m. (1).
St. 157, Maldives, 229 m. (1).
St. 184, Gulf of Aden, 1270 m. (empty tubes).
St. 185, Gulf of Aden, 2000 m. (empty tubes).

Distribution.—Atlantic, Mediterranean, Indian Ocean, Japan, New Zealand.

Remarks.—Nearly all these specimens are in poor condition and I can add nothing to the accounts of this well-known species. The gills begin between the 18th and 20th chætigers.

Genus *Rhamphobrachium* Ehlers.

Rhamphobrachium bipes n. sp.

Occurrence :

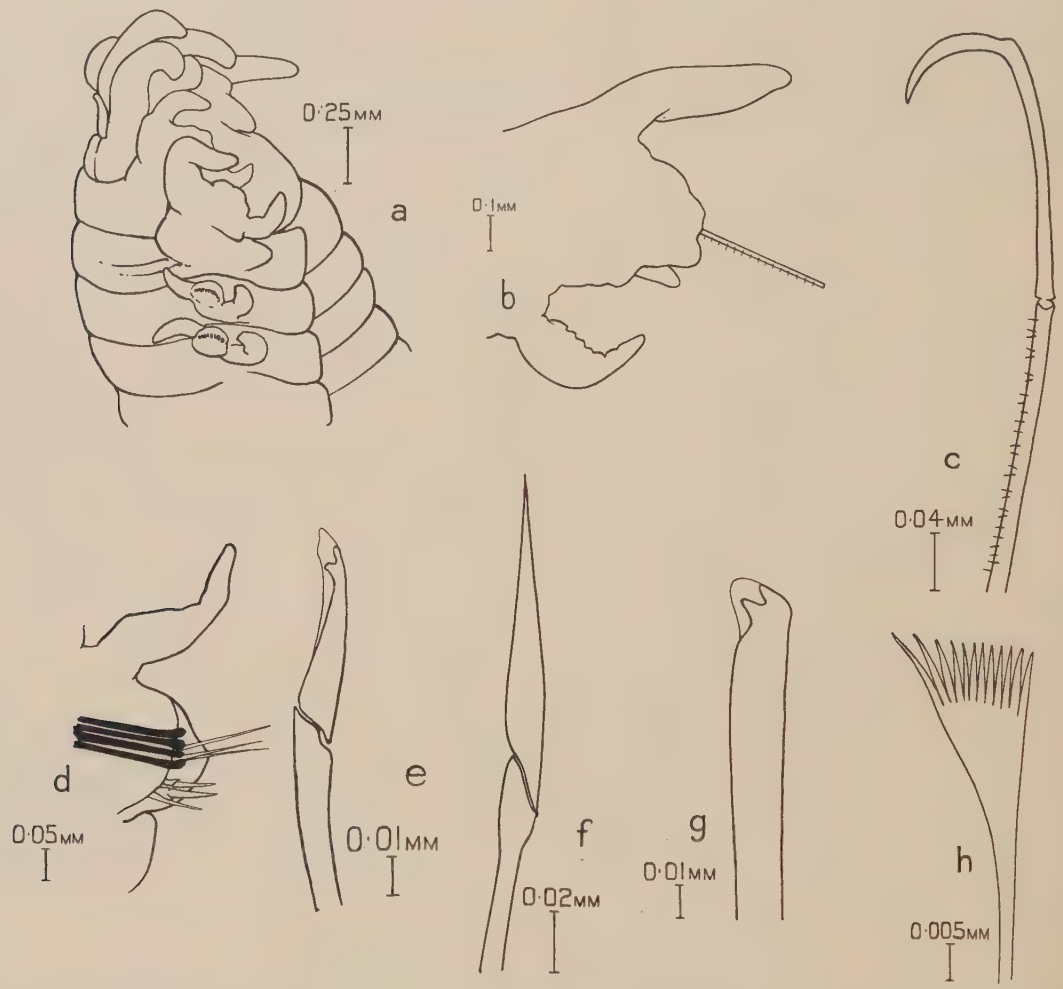
St. 178, Gulf of Aden, 91 m. (1).

Distribution.—Gulf of Aden.

Description.—An anterior fragment in rather bad condition, measuring 16 mm. by 2 mm. for 45 chætigers. It presents certain unusual features, which justify description in spite of the poverty of the material. The body is more or less cylindrical, and in spirit there is no colour. The palps consist of a pair of transversely elongate lobes, and there is a pair of flattened semi-ovate frontal tentacles. The occipital tentacles are short and stumpy, and their tentaculophores occupy about a third of their length. The median and inner lateral tentacles reach back to the 3rd chætiger, and the outer laterals are about two-thirds of this. There is a pair of eyes situated between the bases of the lateral

tentacles. From the front border of the buccal segment there arises a pair of tentacular cirri reaching a little beyond the bases of the inner lateral tentacles.

Only the first 2 feet are modified (Text-fig. 16*a*), and not the first three as is usual in the genus. These are elongate, and carried forward at the sides of the head. They have stout dorsal and ventral cirri, and at the base of the distal edge of the first foot (Text-fig. 16*b*) there is a conical papilla. I cannot see any dorsal or apical papillæ and the



Text-fig. 16.—*Ramphobrachium bipes*. *a*, Side view of anterior region. *b*, 1st foot. *c*, Hook from 2nd foot. *d*, 6th foot. *e*, Compound bidentate bristle from 3rd foot. *f*, Compound bristle from 6th foot. *g*, Bidentate hook. *h*, Comb-bristle.

ventral papilla present on the first foot is not apparent on the second foot, but it should be said that these feet have undergone some distortion. The ventral cirrus is converted into a pad by the 5th foot, and there is no cirriform prolongation of the posterior lip of the chætal lobe. The first 2 chætigers carry long bristles (Text-fig. 16*c*), having curved tips, a small boss below the terminal curved region and below the boss 2 rows of spinelets. I cannot see a tridentate hook such as Augener (1927, text-fig. 8) figures for *R. chuni*. The 3rd foot is similar to those that follow (Text-fig. 16*d*). It carries capillary bristles, hooded bidentate compound bristles (Text-fig. 16*e*) and comb-bristles, and is supported by 4 yellow acicula, which in the present specimen have their ends broken. The

hooded, bidentate, sickle-shaped, compound bristles are confined to the third foot. The 4th foot and the next few chætigers, the exact number of which I have not determined, are supported by 3 or 4 yellow acicula with expanded lanceolate tips and carry capillary bristles, compound bristles with cultriform blades (Text-fig. 16*f*) and a few comb-bristles. Behind this the compound bristles disappear, their place being taken by a pair of large bidentate hooks (Text-fig. 16*g*), and the tips of the acicula are no longer expanded, but slender and pointed. The comb-bristles (Text-fig. 16*h*) have about 12 teeth.

The dorsal cirri are slender and subulate. The gills begin with a single filament already longer than the dorsal cirrus at the 7th chætiger. They are bifid at the 10th chætiger and show 5 filaments at about the 40th chætiger.

The material does not permit me to examine the jaws. The specimen is accompanied by a soft tube encrusted with fine sand and shell.

Remarks.—This species is at once distinguished from all other members of the genus by the fact that only the first 2 feet and not the first 3 are modified.

Rhamphobrachium diversosetosum n. sp.

Occurrence :

St. 163, Maldives,274 m. (1).

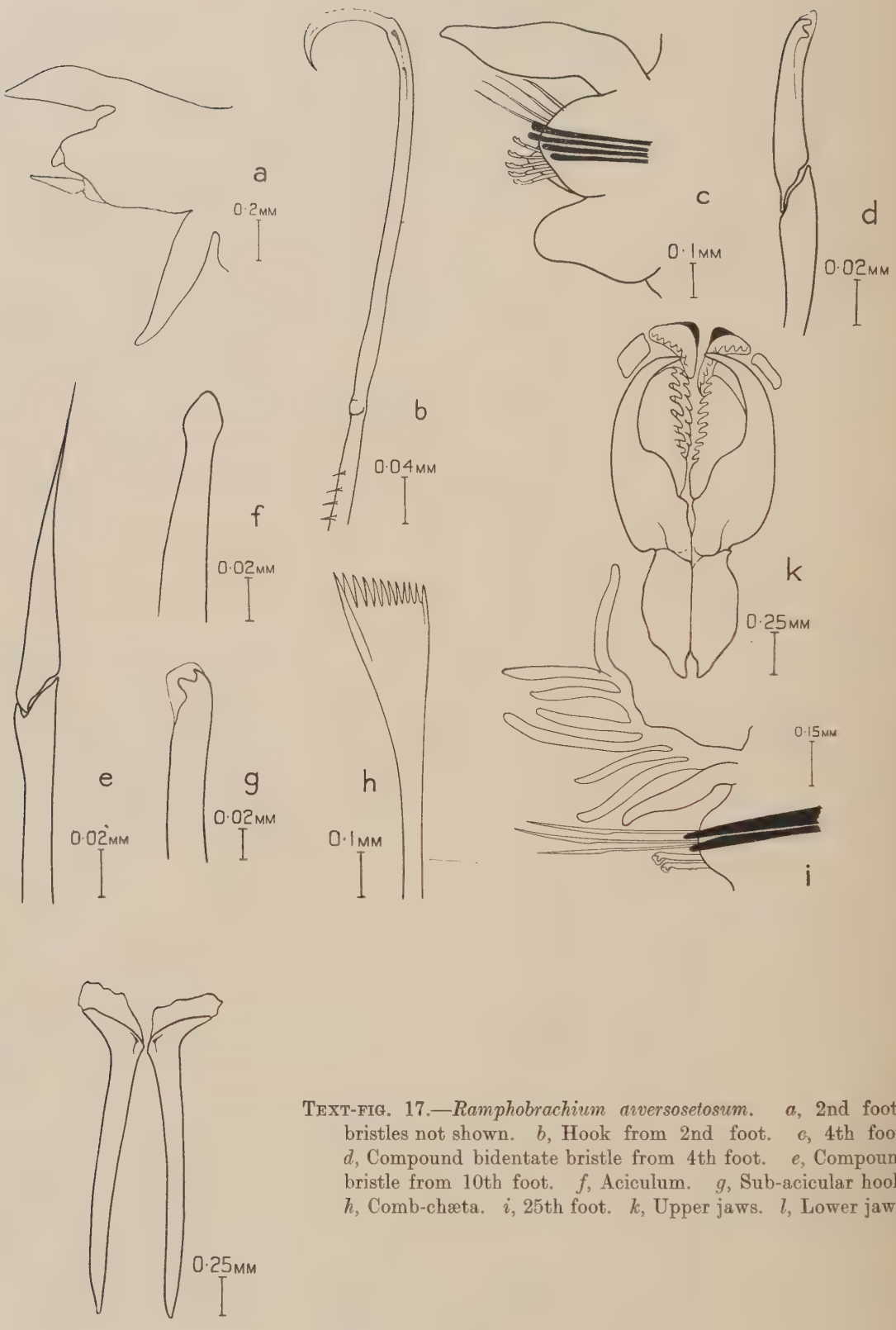
St. 164, Maldives, 183 m. (1).

Distribution.—Maldives.

Description.—Both specimens are incomplete. The larger measures 30 mm. by 3 mm. for 52 chætigers and the smaller 19 mm. by 3 mm. for 36 chætigers. The body is more or less cylindrical. The palps and frontal tentacles are marked with black dorsally, there is a black ring round the occipital tentacles just above the tentaculophores, and there are splashes of black on the ventral surface of the buccal and the following 3 segments. The palps are globular, and the frontal tentacles ovate. The occipital tentacles are slender and have short tentaculophores. The median and the inner lateral tentacles reach back to the 4th chætiger, and the outer laterals are about two-thirds of this. There is a pair of small eye-spots between the lateral tentacles. The buccal segment carries a pair of tentacular cirri reaching halfway up the tentaculophores of the inner lateral tentacles.

The first 3 feet (Text-fig. 17*a*) are elongated and carried forward beside the head. They have large dorsal and ventral cirri, and carry a cirriform process arising from the base of the distal edge of the foot. They carry the enormously long bristles (Text-fig. 17*b*) with curved tips characteristic of the genus. I see no tridentate hook such as Augener found in the bristles of *R. chuni*.

The ventral cirri disappear by the 7th chætiger, and the dorsal cirri are rather short and subulate. The fourth foot (Text-fig. 17*c*) carries capillary bristles and compound bidentate hooks (Text-fig. 17*d*) with sickle-shaped ends. These compound bristles are confined to the 4th foot. For about the following 10 chætigers the place of the compound bristles with sickle-shaped blades is taken by compound bristles with cultriform blades (Text-fig. 17*e*). In this anterior region the feet are supported by 4 yellow acicula (Text-fig. 17*b*) with expanded tips. Between the 10th and 20th chætigers the compound bristles disappear and their place is taken by a pair of yellow, bidentate, hooded, acicular hooks (Text-fig. 17*g*), and at the same time the 4 acicula are replaced by a pair of stout acicula with pointed ends. Comb-bristles (Text-fig. 17*h*) with about 12 teeth are present.



TEXT-FIG. 17.—*Ramphobrachium aversosetosum*. *a*, 2nd foot; bristles not shown. *b*, Hook from 2nd foot. *c*, 4th foot. *d*, Compound bidentate bristle from 4th foot. *e*, Compound bristle from 10th foot. *f*, Aciculum. *g*, Sub-acicular hook. *h*, Comb-chæta. *i*, 25th foot. *k*, Upper jaws. *l*, Lower jaws.

The gill begins with a single filament at the 10th chætiger and reaches a maximum of about 8 filaments (Text-fig. 17*i*). On the terminal segment (52nd) of the larger fragment the gills are still richly branched.

I figure the jaws (Text-fig. 17*k* and *l*). The dental formula is 7–9 : 8 + 7–7.

Remarks.—The only other species of the genus with the first 3 feet modified and compound bristles in the unmodified chætigers are *R. brevibrachiatum* (Ehlers) and *R. ehlersi* Monro. *R. brevibrachiatum* lacks the long hooks of the first 3 feet, and *R. ehlersi* has no compound bristles with sickle-shaped blades in the 4th foot. There are also other points of difference. It is allied to *R. bipes*, but differs in having the first 3 feet modified instead of the first 2.

Genus *Lumbrinereis* Blainville.

Lumbrinereis latreilli Audouin and Milne-Edwards.

Fauvel, 1923, p. 431, fig. 171 *m–r* ; and 1932, p. 152.

Occurrence :

St. M.B. IIa, South Arabian Coast, 11 m. (2).

Distribution.—Atlantic, Mediterranean, Indian Ocean, Pacific.

Remarks.—Two small fragments which I believe to belong to young specimens of this species.

Lumbrinereis impatiens Claparède.

Fauvel, 1923, p. 429, fig. 171 *a–i* ; and 1932, p. 152.

Occurrence :

St. 149, Maldives, 238 m. (2).

Distribution.—Atlantic, Mediterranean, Indian Ocean.

Remarks.—Two small anterior fragments, which as far as they go agree with Claparède's species.

Lumbrinereis heteropoda Marenzeller.

Crossland, 1924, p. 4, text-figs. 1–7.
Fauvel, 1932, p. 153.

Occurrence :

St. 147, Maldives, 27 m. (2).

St. 194, Gulf of Aden, 220 m. (2).

Distribution.—West Africa, Indian Ocean, Pacific.

Remarks.—The specimens from St. 194 are in very poor condition and are doubtfully of this species.

Lumbrinereis quasibifilaris n. sp.

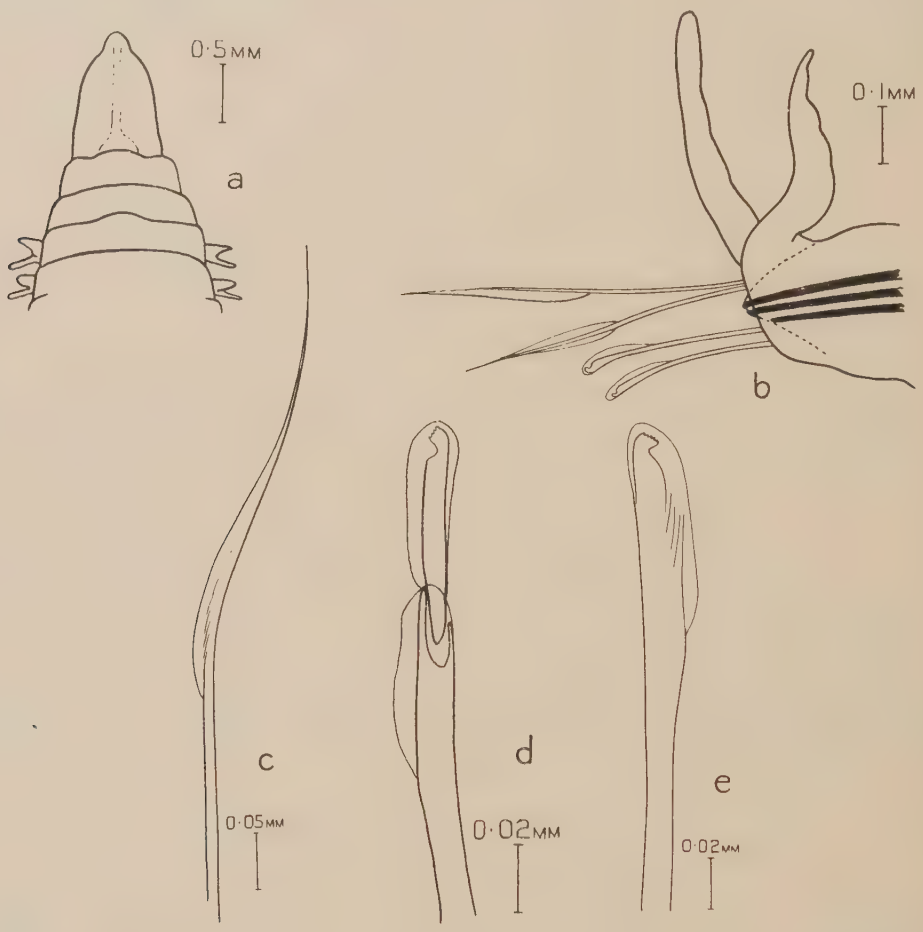
Occurrence :

St. 180, Gulf of Aden, 397 m. (1).

Distribution.—Gulf of Aden.

Description.—An anterior fragment measuring 8 mm. by 2 mm. for 26 chætigers. The colour in spirit is pale yellow and there is very little tapering of the body in front.

The prostomium (Text-fig. 18*a*) is long, lanceolate and flattened. There is a pair of mouth-pads. The buccal segment is about twice as long as the second, and the second about equal to the 1st chætiger. Ventrally the first 2 segments are involved with the mouth. The first few feet have a low rounded anterior lip and a posterior lip tapering at the tip. The tip of the posterior lip rapidly elongates from before backwards into a cirriform process. The anterior lip shows little change, until suddenly at the 8th chætiger it develops a cirriform process similar in size and shape to that of the posterior. These



Text-fig. 18.—*Lumbrinereis quasibifilaris*. *a*, Head from above. *b*, 20th foot. *c*, Capillary bristle. *d*, Compound crochet. *e*, Simple crochet.

2 cirriform processes continue to elongate (Text-fig. 18*b*), until at the end of the fragment (26th chætiger) they are of considerable length. The bristles are somewhat damaged, but it can be seen that up to about the 20th chætiger they consist of winged capillaries (Text-fig. 18*c*) and *compound crochets* (Text-fig. 18*d*). Behind this the compound crochets disappear and are replaced by simple crochets (Text-fig. 18*e*).

The material does not permit me to examine the jaws.

Remarks.—This species belongs to that group which has two long cirriform ligules to the feet. Of these Kinberg's *Larymna cirrosa* has eyes and a semi-globular prostomium and apparently no compound hooks. Ehlers' *L. bifilaris* has no compound hooks in the anterior region, and Fauvel's *L. pseudobifilaris* has no hooks at all.

Genus *Drilonereis* Claparède.

Drilonereis filum Claparède.

Fauvel, 1923, p. 436, fig. 174 *a–h*; and 1932, p. 159.

Occurrence :

St. 28, Gulf of Aden, 201 m. (1).

Distribution.—Atlantic, Mediterranean, Indian Ocean.

Family Spionidæ.

Genus *Prionospio* Malmgren.

Prionospio pinnata Ehlers.

Fauvel, 1932, p. 173, with synonymy.

Occurrence :

St. 147, Maldives, 27 m. (1).

St. 179B, Gulf of Aden, 275 m. (2).

Distribution.—Atlantic, Indian Ocean, Pacific.

Remarks.—The specimens from St. 179B are damaged in front and the prostomial wings are not very clear. They are only probably of this species.

Family Magelonidæ.

Genus *Magelona* F. Müller.

Magelona sp. juv.

Occurrence :

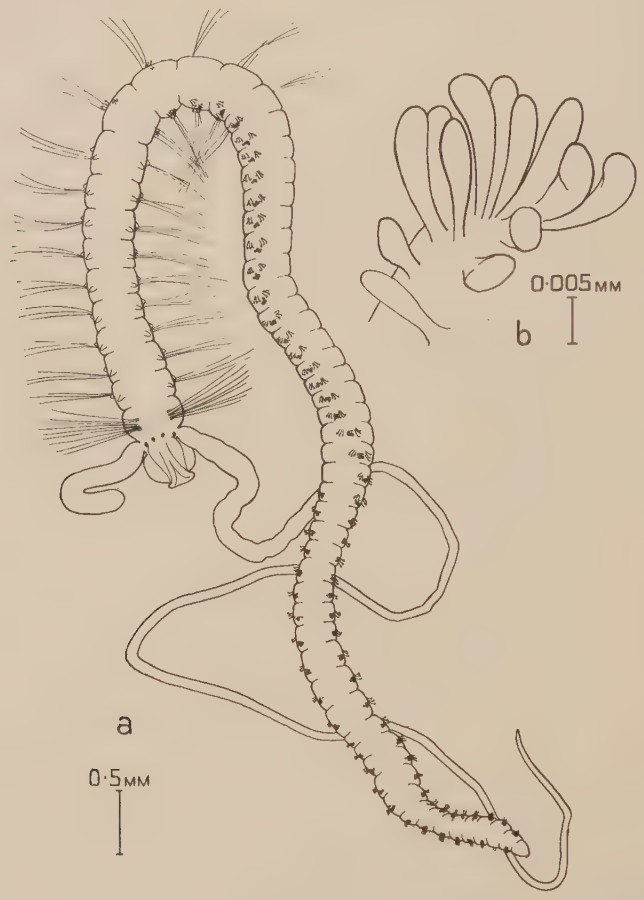
St. 145C, Maldives, 400–0 m. (1).

Distribution.—Maldives.

Description.—This small pelagic annelid (Text-fig. 19*a*), which I take to be the post-larva of a *Magelona*, measures 11 mm. by 0·5 mm. for 56 chætigers. The large prostomium is rounded, except where the keel broadens in front to form a more or less hammer-shaped process. The cephalic plate appears to be continued back as far as the 1st chætiger. There is a pair of palps, of which one is broken off short and the other, though incomplete, is a little longer than the body. Palpar papillæ are very difficult to see, especially as where the palp is contracted the rugosities may easily be mistaken for papillæ, but in one or two places I believe that I see true papillæ (Text-fig. 19*b*). Slender spine-like larval papillæ (*Stabchen*) are absent. The first 9 chætigers are distinguished by the presence of only very delicate capillary swimming-bristles in both rami. They are not all of the same size, some being very long and others short. They are quite featureless and I cannot tell whether the shorter bristles are just broken off. In the 1st chætiger these bristles are much more numerous than in the rest. In this anterior region there are a small triangular dorsal lamella and an even smaller conical ventral lamella. These lamellæ extend only to the 9th chætiger. As far as can be seen the 9th chætiger does not

differ from the rest in the anterior region, and I can see no bristles with expanded tips such as are found in *M. papillicornis*.

The 10th chætiger is characterized by the first appearance of the hooded bidentate hooks. Up to the 15th chætiger the dorsal rami still carry a bundle of capillary swimming-bristles as well as 1 or 2 hooks, and the ventral rami 2 or 3 hooks only. Behind the 15th chætiger there are about 3 hooks in both rami of the feet, and the capillary swimming-bristles are absent. In the hinder region (*i. e.* behind the 9th chætiger) I see



TEXT-FIG. 19.—*Magelona* sp. *a*, Dorsal view of specimen. *b*, Papillæ of palp.

no lamellæ of any kind, but just behind the feet there are patches of dark brown grânular pigment. The body ends in a pair of small globular cirri.

REMARKS.—Owing to the difficulty of establishing with certainty the presence of true adult papillæ on the palps, I was at first inclined to regard this specimen as a post-larval Spionid, but I am now satisfied that it is a true *Magelona*. Claparède (1863, p. 74, pl. x, figs. 9–14, and pl. xi, figs. 1, 2) and McIntosh (1894, p. 66, pl. viii, figs. 1–7) have both described post-larvæ of a *Magelona*, and the present form bears some resemblance both to that figured by Claparède (pl. x, fig. 12) and to that figured by McIntosh (pl. viii, fig. 3). As far as its specific attribution goes, it is nearer to *M. pacifica* mihi (Monro, 1933*a*, text-fig. 2*a*) in the shape of its prostomium than to Gravier's Red Sea *M. obockensis*.

Family Chætopteridæ.

Genus *Phyllochætopterus* Grube.

Phyllochætopterus sp.

Occurrence :

St. 70, Gulf of Oman, 196 m. (numerous tubes).

St. 184, Gulf of Aden, 1270 m. (numerous tubes).

Remarks.—Clusters of empty tubes probably belonging to *Ph. socialis*. In the absence of a specimen this cannot be verified.

Family Cirratulidæ.

Genus *Cirratulus* Lamarck.

Cirratulus sp.

Occurrence :

St. 164, Maldives, 183 m. (1).

Remarks.—A small cirratulid in poor condition. The gills begin on the 1st chætiger, and in the one specimen are continued over about the anterior half of the body. There are the scars of about 7 pairs of tentacular filaments on the 1st and 2nd chætigers. There are no hooks. The specimen agrees with *C. filiformis* Keferstein, except in the relatively high number of tentacular filaments.

Genus *Chætozone* Malmgren.

Chætozone setosa Malmgren.

Fauvel, 1927, p. 101, fig. 35 *d–k*.

Occurrence :

St. 178, Gulf of Aden, 91 m. (1).

Distribution.—Atlantic, Mediterranean, Gulf of Aden.

Remarks.—The specimen is dark green in spirit. I cannot obtain an exact measurement, but it has a length of about 12 mm. and a width of 2 mm. at the widest part for 60 chætigers. The palps and all except two or three isolated branchial filaments are lost. I have compared it with a specimen from Spitzbergen, and within the limits of the material I can find no ground for separation. The type-material of McIntosh's *Chætozone atlantica*, *pacifica* and *benthaliana* is so much damaged as to be almost useless for purposes of identification.

Family Chlorhæmidæ.

Genus *Stylarioides* Delle Chiaje.

Stylarioides xanthotrichus (Schmarda).

Ehlers, 1908, p. 119, pl. xvi, figs. 1, 2.
Augener, 1918, p. 431, text-fig. 60.

Occurrence :

St. 45, South Arabian Coast, 38 m. (16).

St. 53, South Arabian Coast, 13·5 m. (14).

Distribution.—South-west Africa, Arabian Coast.

Remarks.—These specimens measure 15–20 mm. in length by 3 mm. in breadth at the widest part for about 60 chætigers. The segments of the tail are very difficult to count. The body is clearly divided into trunk and tail, and the trunk has about 25 chætigers. The first 2 chætigers, and to a much lesser extent the third, go to form the cephalic cage.

Text-fig. 20.—*Stylarioides xanthotricus* (Schmarda). Ventral hook of 3rd foot.

The bristles of the first 2 chætigers form a conspicuous iridescent palisade in front. The dorsal bristles of the 3rd chætiger are reduced to about 2 in number, and although they point forwards like the bristles of the first 2 chætigers, they are very much smaller and quite inconspicuous. I see only a single bristle in the ventral bundle of the 3rd chætiger, and this is a slender barred bristle with a hooked tip (Text-fig. 20). It is unlike any other bristle in the body. The dorsal bristles over the rest of the body are reduced to 1 or 2 barred capillary bristles in each notopodial bundle. They are so slender that they are difficult to see. The true hooks begin on the 4th chætiger. They are strong dark brown structures without striæ, and resemble Augener's figure. In these specimens there is nevér more than one in each neuropodial bundle, but they are accompanied by 3 or 4 rudimentary hooks which do not pierce the skin.

Sand-grains do not adhere to the body except at the anterior end. There is a kind of ring or collar extending over the first 3 chætigers in which the skin papillæ have a similar form to those of the shield of *St. parmatus*, and here sand-grains are usually collected. Over the rest of the body the papillæ are small and globular, and form roughly two transverse rows in each segment. None of the specimens has the gills everted, and the condition of the material internally is not suitable for dissection. As far as can be seen, the gills are attached to a semicircular membrane surrounding the base of the paired canaliculate palps.

Stylarioides hamocarens n. sp.

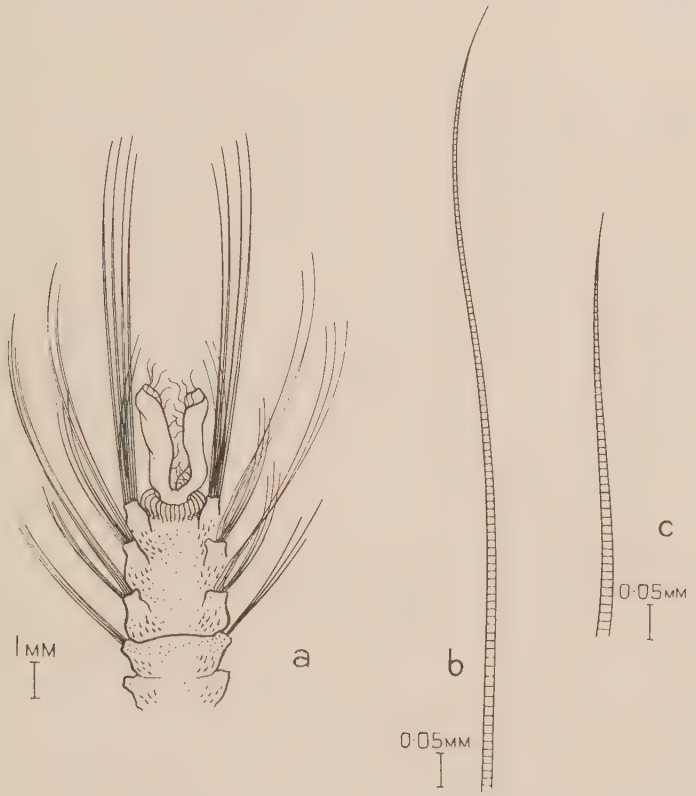
Occurrence :

St. 86, North Arabian Sea, 759–1024 m. (1).

Distribution.—Arabian Sea.

Description.—A single specimen, incomplete posteriorly and measuring 23 mm. by 3 mm. for 27 chætigers. The body is of about the same diameter throughout. In spirit the colour is dark green in front, merging into yellow behind. There are no sand-grains, and the body is dotted with small papillæ incrusted with mud at the base and with short clavate tips. In the neighbourhood of the feet there are a number of long, cylindrical papillæ. There is a well-developed cephalic cage (Text-fig. 21*a*) formed from the first 3 chætigers, which are provided with pedal lobes absent over the rest of the body. The dorsal bristles of the first 3 chætigers are immensely long, one from the 1st foot being equal in length to the first 13 chætigers. The ventral bristles of the cage are about half as long as the dorsal. Otherwise dorsal and ventral bristles are similar, both having well-marked closely-set striæ and long flagelliform tips. Dorsal and ventral bristles of the

4th chætiger are of the same type as those of the cage, but considerably smaller; they are nevertheless much longer than those of the mid-body, and there is a gradual decrease in the size of the bristles from before backwards as far as about the 8th chætiger. Here and over the rest of the body the dorsal bristles (Text-fig. 21*b*) are about as long as the body is wide, and the ventral bristles (Text-fig. 21*c*) are about half the length of the dorsal. Throughout the body dorsal and ventral bristles are of similar character, being slender, striated, and ending in fine, flagelliform tips. There is no trace of ventral hooks.



Text-fig. 21.—*Stylarioides hamocarens*. *a*, Anterior region from above. *b*, Dorsal bristle. *c*, Ventral bristle.

The gills are everted. They are very numerous and filiform and borne on two separate, divergent, stout, membranous lobes with their sides folded inwards. When unfolded, these lobes are more or less spoon-shaped in outline, but in their natural folded condition they are narrowly oblong. No palps can be seen.

Remarks.—This species has affinities with *St. bifidus* Fauvel, especially in the structure of the cephalic cage and in the bifid nature of the branchial apparatus, but differs in the total absence of ventral hooks. I know no other *Stylarioides* that has a bifid branchial apparatus and no ventral hooks.

Genus *Brada* Stimpson.

Brada villosa (Rathke).

Fauvel, 1927, p. 121, fig. 43 *e–l*.

Occurrence :

St. 79, South Arabian Coast, 95–102 m. (1).

Distribution.—Atlantic, Mediterranean, Pacific, Arabian Coast.

Remarks.—This specimen, thickly coated with sand-grains especially on the dorsal surface, measures 13 mm. by 3 mm. for 30 chætigers. I have compared it with McIntosh's examples of *Brada mammillata* Grube, to which species Fauvel (1932, p. 185) has attributed a specimen from the Arabian Sea, and with Augener's redescription (Augener, 1932, p. 54) of Grube's material. *B. mammillata* is a larger species (up to about 70 mm. in length) than *villosa*, with heavy dark brown ventral bristles, and in the hinder region conspicuous transverse rows of large skin-warts, absent in *villosa*.

Genus *Flabelligera* Sars.

Flabelligera diplochaitos (Otto).

Fauvel, 1927, p. 114, fig. 40 *g–o*.

Occurrence :

St. 43, South Arabian Coast, 83–100 m. (3).

Distribution.—Mediterranean, Arabian Coast.

Remarks.—Three damaged specimens. Within the limits of the material they agree with the Mediterranean species, which is distinguished from the Atlantic *Fl. affinis* chiefly on the possession of 4 to 6 hooks in the neuropods instead of 2. According to Fauvel this difference is constant. This species, *Fl. affinis* Sars and the South African *Fl. luctator* Stimpson are all very close.

Genus *Ilyphagus* Chamberlin.

Ilyphagus hirsutus n. sp.

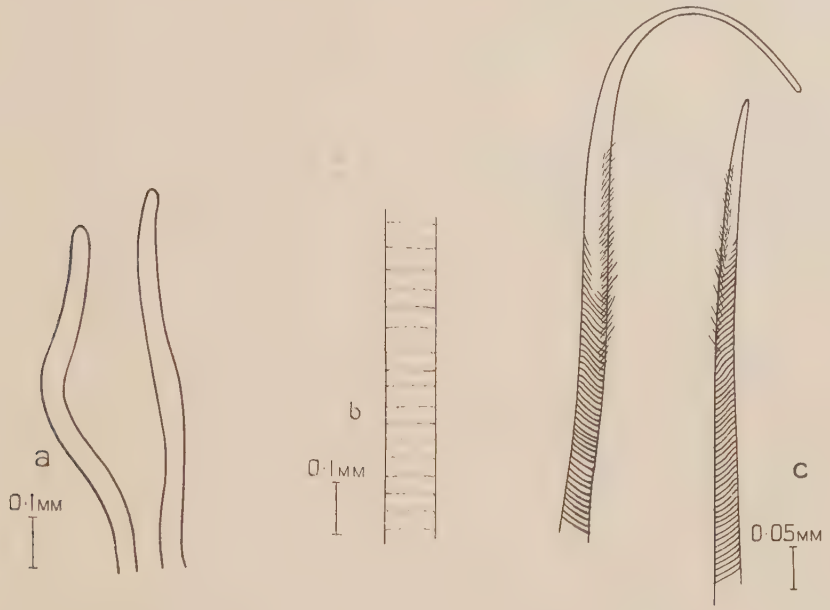
Occurrence :

St. 133, South Arabian Sea, 3385 m. (1).

Distribution.—Arabian Sea.

Description.—A sac-like creature shaped like an *Echiurus* and with a dense, uniform, fur-like covering of long, cirriform papillæ (Text-fig. 22*a*). It is pale grey in colour and to a slight extent coated with mud. The specimen is damaged and there is no trace of a prostomium, and no means externally of distinguishing the front from the hinder end. External segmentation is revealed only by the bristle-bundles, and when these are broken off their place of origin is lost among the papillæ. I have counted twelve ventral bristle-bundles on one side, and they occupy about half the length of the body. The measurements are 39 mm. by 14 mm. The dorsal bristle-bundles have disappeared except for 2 or 3 isolated bristles all broken at the end. These bristles (Text-fig. 22*b*) are very long and have the usual transverse striæ. They are very like that figured by Chamberlin (1919, pl. 69, fig. 4) for his *Ilyphagus bythincola*. The ventral bristle-bundles carry about a dozen bristles (Text-fig. 22*c*). These are shorter and stouter than the dorsal. They are obliquely striated, and many of them end in long tapering tips. In others these delicate tips are missing and the blades end in a sharp point. I assume that the absence of the tips is due to wear. In addition to the striæ towards the distal end these ventral bristles have rows of stout hairs. The body-papillæ have an external coating of varying length and thickness, composed of fine mud cemented with mucus.

Remarks.—With the present material I cannot carry the description of this species any further. It is distinguished from Chamberlin's *I. bythincola*, *I. pluto* and *I. ascendens* by the hirsute character of its ventral bristles. I suspect, however, that further material



Text-fig. 22.—*Ilyphagus hirsutus*. *a*, Papillæ. *b*, Part of dorsal bristle. *c*, Ventral bristles.

may reveal that all the three species of Chamberlin and my *hirsutus* are conspecific. *Ilyphagus* appears to be an abyssal genus.

Family Capitellidæ.

Genus *Notomastus* Sars.

Notomastus latericeus Sars.

Fauvel, 1927, p. 143, fig. 49 *a–h*; and 1932, p. 194.

Occurrence:

St. 80, South Arabian Coast, 16–22 m. (1 juv.).

Distribution.—Atlantic, Mediterranean, Falkland Islands, Indian Ocean.

Genus *Dasybranchus* Grube.

Dasybranchus caducus Grube.

Fauvel, 1927, p. 148, fig. 52 *a–h*; and 1932, p. 195.

Occurrence:

St. 137, Maldives, 46 m. (1).

St. 147, Maldives, 27 m. (1).

Distribution.—Atlantic, Mediterranean, Indian Ocean, Pacific.

Remarks.—I cannot discover any branchiæ in the specimen from St. 137. They are either retracted or lost, for in other respects it agrees with this species.

Family Maldanidæ.

Genus *Maldane* Grube.

Maldane cristata Treadwell.

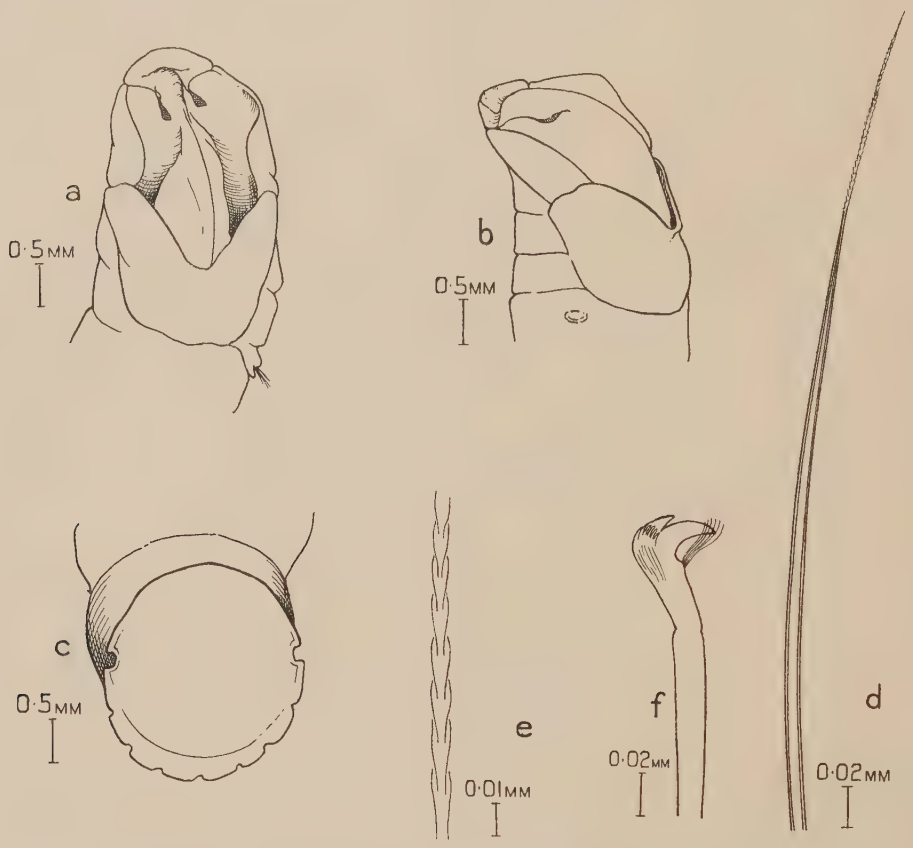
Treadwell, 1923, p. 9, figs. 5–8.

Occurrence :

St. 70, Gulf of Oman, 196 m. (2).

Distribution.—Lower California, Gulf of Oman.

Remarks.—A number of thick muddy tubes from which I have extracted two complete specimens in poor condition. The larger measures 62 mm. by 2 mm. There



Text-fig. 23.—*Maldane cristata* Treadwell. *a*, Head from above. *b*, Head from the side. *c*, Anal plate. *d*, Bilimbate dorsal bristle. *e*, Part of barbed dorsal bristle. *f*, Hook.

are 19 chætigers followed by 2 low rings which I take to represent 2 achætous anteanal segments. Cephalic plate oval (Text-fig. 23*a* and *b*), with a high keel running for about three-fourths of its length. The nuchal organs are short and curved ; they run parallel with the keel for about half their length, and then turn outwards at the sides of the crescentic palpode. There is a wide border divided into 3 quite smooth lobes by a pair of deep lateral incisions. The dorsal lobe of the border forms a deep hood at the back of the head. Ocelli are not visible.

There is no collar. Owing to the condition of the material the limits of the segments are indistinguishable. The buccal segment and first 3 chætigers are more or less uniformly

glandular. The 3rd chætiger shows also a narrow, prechætal, deeply staining, glandular band at the sides and underneath, but not on the dorsal surface. The 4th to the 7th chætigers show similar, but wider glandular bands. The 4th, 5th and 6th chætigers also show a pair of dorso-lateral glandular patches lying above and in front of the glandular bands.

The pygidium is as figured by Treadwell. It forms a flat plate (Text-fig 23*c*) at right angles to the main axis of the body. Its border has a pair of deep lateral incisions. Dorsally its edge is smooth, but ventrally below the lateral incisions the edge is cut up into a series of teeth more pronounced in these specimens than in Treadwell's figure. The dorsal bristles are of two kinds—bilimbate capillary bristles (Text-fig. 23*d*) with barbed tips, and long, very fine, delicate barbed bristles (Text-fig. 23*e*) The hooks (Text-fig. 23*f*) have in profile one tooth above the main fang, and above this a crown of fine denticles. The subrostral barbules curl over the tip of the main fang.

These specimens agree in the main with Treadwell's species described from an example obtained at a depth of 475 fms. off the coast of Lower California. I cannot, however, discover from Treadwell's account the shape of the nuchal organs, and the identification must remain uncertain. In the present specimens they are more curved than is usual in the genus. The species is characterized by the high keel, the deep cephalic pouch, and the denticulated ventral border of the anal plate. In the structure of the anal plate this species is close to *M. glebifex*, but the head is different. *Maldane gorgonensis* mihi is an allied species, but the keel is less convex and the border of the anal plate quite smooth.

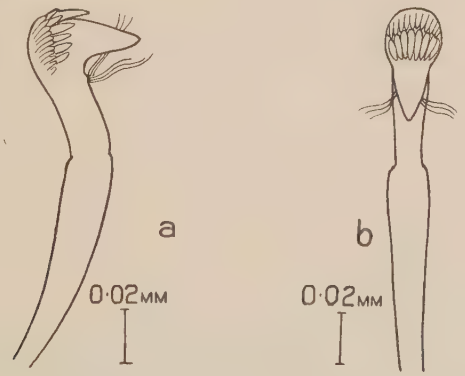
Maldane sarsi Malmgren var. *tropica* var. nov.

Occurrence :

St. 58, South Arabian Coast, 1189-1354 (3).

Distribution.—Arabian Coast.

Remarks.—From a number of thick muddy tubes I have succeeded in extracting three anterior and three posterior fragments. I have compared them with examples of the northern species, which Fauvel has also recorded from the Indian Ocean, and I see no ground for separation except that after staining with iodine green I can find no trace of the glandular crescent on the dorsal surface of the 5th chætiger which is constantly present in Malmgren's species. Moreover, the teeth in the row lying immediately above the main fang of the uncini (Text-fig. 24*a* and *b*) are smaller and more numerous. They are very



Text-fig. 24.—*Maldane sarsi* Malmgren var. *tropica* var. nov. *a*, Hook from the side. *b*, Hook from in front.

difficult to count, but I estimate 8 to 10. The subrostral barbules are more numerous and better developed than in the stem-form, and are formed in some uncini at any rate of two divergent bundles separated by the point of the main fang.

In other respects, in the form of the head and the anal plate, in the character of the bristles and in the arrangement of the glandular areas these specimens agree with *sarsi*.

Genus *Notoproctus* Arwidsson.

Notoproctus pacificus (Moore) ?

Lumbriclymene pacifica Moore, 1906, p. 246, pl. xii, figs. 40–42.
Notoproctus pacificus Arwidsson, 1922, p. 4, pl. i, figs. 1–4.

Occurrence :

St. 33, Gulf of Aden, 1295 m. (4).

Distribution.—Alaska, Vancouver Island, Gulf of Aden.

Remarks.—A number of very fine, separate, sandy tubes, from which I have extracted four small fragmentary specimens. They are quite colourless. Three are anterior fragments and there is one posterior. The largest measures 19 mm. by 0·5 mm. for 17 chætigers. They represent an exceedingly slender Maldanid and are in poor condition. The limits of the segments are impossible to determine.

The specimens may be young representatives of Moore's species. The head and hinder end, as far as can be made out, correspond to Arwidsson's figures, and there appear to be 2 posterior ridges marking the presence of 2 ante-anal achætous segments. Prechætal glandular girdles seem to be present in all somites. The bristles and hooks correspond closely to Moore's figures.

Moore's specimens were taken at a depth of 282 fms. in Chatham Strait, Alaska, Arwidsson's at a depth of 37 m. off Nanaimo, Vancouver Island, and the present specimens were obtained at a depth of nearly 1300 m.

Genus *Clymene* Savigny.

Clymene (*Praxillella*) *gracilis* (Sars) ?

Fauvel, 1927, p. 178, fig. 62 *m–p* ; and 1932, p. 201.

Occurrence :

St. 180, Gulf of Aden, 397 m. (1).

Distribution.—Atlantic, Mediterranean, Persian Gulf, Gulf of Aden.

Remarks.—An anterior fragment with 3 chætigers. The prostomium ends in a filiform tip, and as far as it goes the specimen agrees with Sars's species.

Clymene sp.

Occurrence :

St. 75, Gulf of Oman, 201 m. (2).

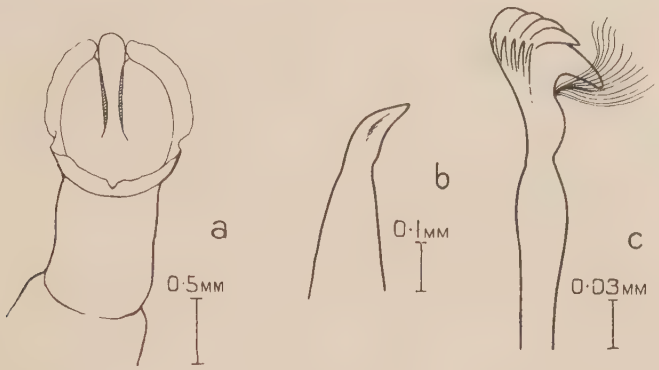
St. 141, Maldives, 44 m. (1).

St. 179B, Gulf of Aden, 275 m. (1).

Remarks.—The largest of these fragments has only 8 chætigers. There is no posterior end. On the head (Text-fig. 25*a*) the keel is narrow and long, occupying three-fourths of the length of the prostomium. The nuchal organs are long, straight, parallel.

The border is high and almost entire. There is a very slight incision in the mid-dorsal line and a pair of scarcely noticeable lateral notches. Ocelli are present. Pre-chætal glandular bands are present on the 5th to 8th chætigers.

The bristles are all simple bordered capillaries. The head of the anterior, ventral acicular hooks (Text-fig. 25*b*) is devoid of denticles and is at an acute angle to the shaft.



TEXT-FIG. 25.—*Clymene* sp. *a*, Head from above. *b*, Anterior ventral hook. *c*, Hook.

The uncini (Text-fig. 25*c*) have rather numerous (4–5) denticles above the main fang. In the absence of a posterior region these specimens cannot be identified. The head with its very long, narrow keel and almost entire border is distinctive.

Genus *Clymenella* Verrill.

Clymenella sp.

OCCURRENCE :

St. 105B, Zanzibar, 238–293 m. (1).

REMARKS.—An anterior fragment of 8 chætigers measuring 28 mm. by 2 mm. The head is an oblique bordered plate with a low keel about two-thirds of the length of the prostomium. The nuchal organs are straight, and the border, which is higher at the sides than it is dorsally, is slightly notched at the sides and in the mid-dorsal line. The anterior border of the 4th chætiger forms a conspicuous, free collar of considerable width and even all round its edge. The feet are in the anterior part of the segment for the first 3 chætigers, and in the remainder are more or less in the middle. The first 3 chætigers show little glandular development. There is a narrow glandular band at the hinder edge of the 4th chætiger, and behind the 4th the prechætal parts of the segments form conspicuous glandular bands. All the bristles that I have seen are slender, bordered capillaries with delicate, elongate tips. The heads of the ventral acicular hooks of the first 3 chætigers turn over very little. The uncini have 4 teeth above the main fang and the usual subrostral barbules. In the absence of a hinder end this specimen cannot be given a specific attribution.

The genus *Clymenella* is in an unsatisfactory condition. It is somewhat loosely defined by Verrill (1900, p. 657), and Arwidsson (1906, pp. 207–209) subjects it to a critical discussion. Its type-species is *Clymenella torquata* (Leidy), of which there is a specimen in the Museum collection from Newport, Rhode Island, identified at, and presented by, the United States National Museum. It has uncini in the ventral rami of the first 3

chætigers, and not acicular hooks. In the 1st chætiger there is a row of 9 uncini, and the number is greater in the following segments. It also has a well-developed, free, membranous collar on the 4th chætiger, a conspicuous, anteanal raised ring and glandular bands in the 4th–8th chætigers. *Clymenella rubrocincta* Johnson has been redescribed by Arwidsson (1922, p. 29), and agrees in a general way with *torquata* except that there is no true collar on the 4th chætiger. I have examined several specimens from Friday Harbour, Washington, which formed part of the material on which Arwidsson's description was based, and I find a certain amount of telescoping of the hinder end of the first 3 chætigers into the anterior end of the segments that follow, especially at the junction between the 3rd and 4th chætigers, but no true collar. The number of uncini in the 1st chætiger is usually 6. The specimen from Coiba Island attributed by me (1933A, p. 1062) to *Clymene* (*Euclymene*) *rubrocincta* (Johnson) is misdetermined—a mistake due to a misapprehension of Johnson's description. Arwidsson (1916, p. 209) suggests that Johnson's *rubrocincta* should form the type of a new genus. I cannot see the necessity for this. *Clymenella* (*Axiothella*) *somersi* Verrill and *Clymenella elongata* Moore, the original description of which I have not been able to see, are, according to Arwidsson, close to *Axiothella catenata* Malmgren. Verrill's species has, in the anterior region, ventral uncini with " a large, sharp rostrate hook, directed somewhat upward and 3 (sometimes 4) small appressed apical hooks ". On the other hand, Arwidsson's *Clymenella minor* (1911, p. 24) has acicular hooks, not uncini, in the neuropods of the first 3 chætigers (the denticles shown in his figure of the anterior hooks in plate ii, fig. 44, are more pronounced than any I have seen), a relatively slightly developed collar on the 4th chætiger and a low pre-anal ring. Fauvel (1927, p. 182) regards *Clymenella* as differing from *Clymene* only by the presence of a collar on the 4th chætiger and refers Saint-Joseph's *Maldane cincta* to it. Augener has also described a *Clymenella* sp. from south-west Australia with ventral acicular hooks in the first three chætigers and a high collar on the 4th. Lastly there is the present specimen from the Indian Ocean.

We have, then, two groups of species under the name *Clymenella*, the *torquata*, *rubrocincta*, *somersi* and (?) *elongata* group, with anterior ventral *uncini* differing little, if at all, from their normal uncini, and the *minor*, *cincta* south-west Australian and Indian Ocean *Clymenella* sp. group, with anterior ventral *acicular hooks*. Both groups have a collar on the 4th chætiger in all species except *rubrocincta*, and in both groups this collar shows much variation in degree of development. Now the presence or absence of anterior ventral acicular hooks is generally used as a generic differential, and it is therefore unsatisfactory to find both groups under the same generic name. The alternative is either to separate the two groups by establishing one, if not two, new genera (if Arwidsson's view of *rubrocincta* be adopted), or to treat the presence of a collar, raised preanal ring and the other characters enumerated by Arwidsson (1906, p. 209) as specific characters, to abandon the genus *Clymenella* altogether, and to refer the group of species with anterior ventral uncini to *Axiothella* and the group with anterior ventral acicular hooks to *Clymene* sensu Fauvel (1927, p. 170). Moreover, the former group would, I believe, be capable of inclusion within *Axiothella*, as defined by Fauvel (1927, p. 183) if the words " pas de collerette " were omitted. Saint-Joseph (1894, p. 131) in his classification of the Maldanids refuses to accept the presence of a collar on the 4th chætiger as a generic character. This procedure would at least have the merit of economy, and the grouping would be more natural than the one obtaining at present.

Genus *Nicomache* Malmgren.

Nicomache sp.

Occurrence :

St. 104, Zanzibar, 207 m. (5).

St. 106, Zanzibar, 183–194 m. (1).

St. 126, Zanzibar, 209 m. (1).

Remarks.—These are all anterior fragments, and in the absence of a posterior region incapable of even generic attribution with any certainty. They seem, as far as they go, to be close to *N. maculata* Arwidsson. The reddish-brown spots on the anterior end and the bristles, hooks, etc., are very like those described for that species.

Genus *Petaloproctus* Quatrefages.

Petaloproctus cirratus n. sp.

Occurrence :

St. 54, South Arabian Coast, 1046 m. (4).

Distribution.—Arabian Coast.

Description.—A small mass of brittle sandy tubes incrusting a Polyzoan yielded a number of anterior and posterior fragments. The largest measures 29 mm. by 2 mm. for 13 chætigers. The anterior and posterior regions are moderately well preserved, but the middle region is torn and macerated. There is no colour. The head and buccal segment (Text-fig. 26*a*) are together shorter than the first chætiger. The first 3 chætigers are about twice as long as the 4th, 5th and 6th, and at the 7th the segments lengthen out again. There is a certain amount of telescoping of the hinder end of the segments into the front end of those that follow in the 2nd to the 5th chætigers. This is most marked at the 4th chætiger, which has a kind of thick collar in front. It is not, however, a true collar with a free margin. Glandular rings are apparently present in all chætigers. They are prechætal anteriorly, and on a level with the feet in the hinder region.

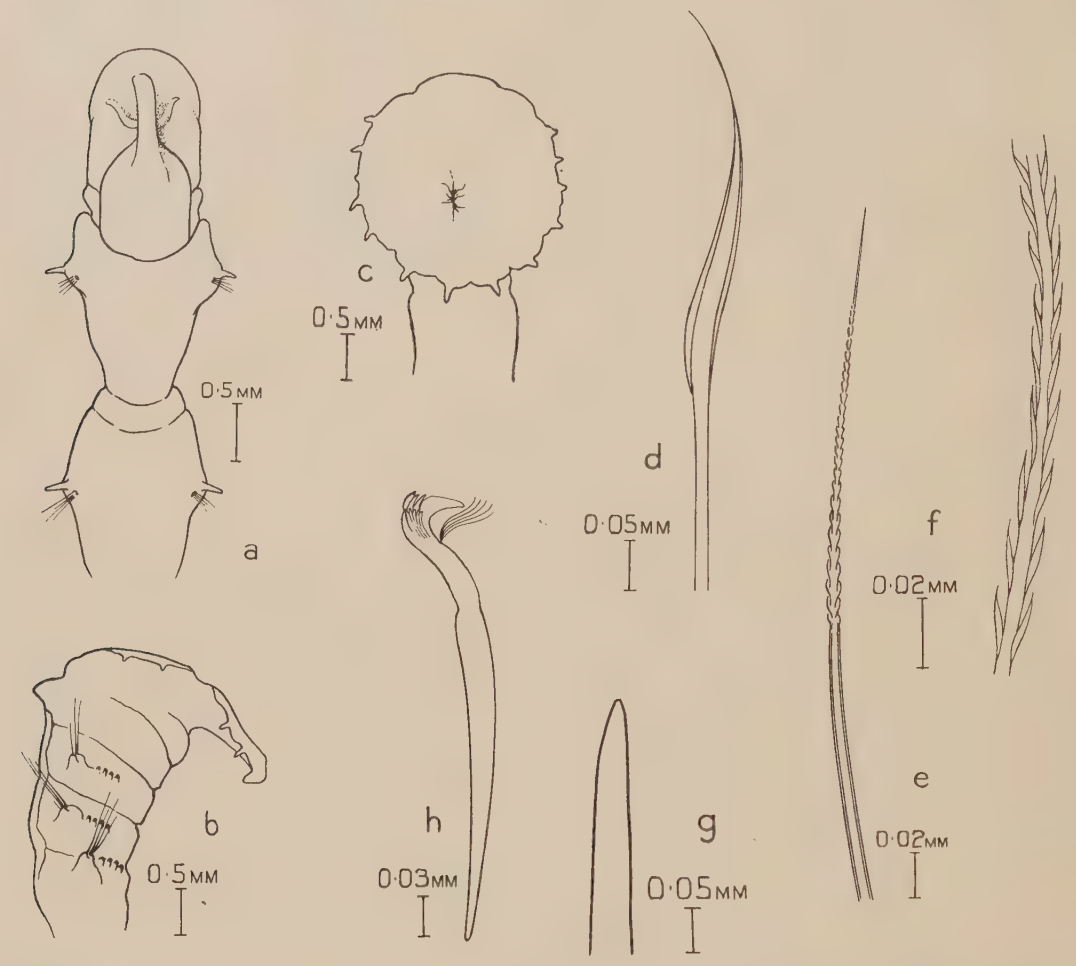
The cephalic plate is very oblique : it is rounded in front, has a prominent keel running up most of its length and a pair of divergent, slightly curved nuchal organs. There is no border. The buccal segment which is dorsally not separated from the head, is very short, being only about one-fourth of the length of the first chætiger. The last chætiger, which carries both bristles and hooks, is followed by 2 low rings, the second of which is incomplete dorsally ; they presumably represent 2 achætous ante-anal segments (Text-fig. 26*b*).

The anal plate (Text-fig. 26*c*) is large and lies at an angle of about 45° to the body. It has a wide border, which disappears dorsally. This border carries about 15 short cirriform processes at intervals along its edge. The pleated anus lies a little below the median line.

The bristles are of three kinds : (1) smooth bristles with wide borders and a long tip (Text-fig. 26*d*) ; (2) narrowly bordered bristles (Text-fig. 26*e*), smooth proximally but with barbed tips ; (3) long, very delicate barbed bristles (Text-fig. 26*f*). The acicular ventral hooks (Text-fig. 26*g*) of the first 3 chætigers are straight and have obtuse tips. The uncini (Text-fig. 26*h*) are as figured. In profile there are 2 principal teeth

above the main fang and these have a cap of denticles. The subrostral barbules are very long.

The description of this species can only be completed on better material. The anal



Text-fig. 26.—*Petaloproctus cirratus*. *a*, Anterior region from above. *b*, Posterior region from the side. *c*, Anal plate. *d*, Smooth bordered bristle. *e*, Bilimbate bristle. *f*, Part of barbed bristle. *g*, Anterior acicular ventral hook. *h*, Hook.

plate with its cirri is unlike that of any other member of the genus. It appears to be most nearly allied to *P. crenatus* Chamberlin, which has, however, no achætous ante-anals and no uncini on the last chætiger.

Family Oweniidæ.

Genus *Owenia* Delle Chiaje.

Owenia fusiformis Delle Chiaje.

Fauvel, 1927, p. 203, fig. 71 *a–f*; and 1932, p. 208, with citations.

Occurrence :

St. M.B. Ib, Red Sea, 29 m. (1).

Distribution.—Atlantic, Mediterranean, Indian Ocean, Pacific.

Remarks.—A single specimen and several fragments of tubes. The imbrication of the particles with which the tube is coated is less obvious than usual.

Family Sabellariidæ.

Genus *Sabellaria* Lamarck.

Sabellaria spinulosa Leuckart.

Fauvel, 1927, p. 208, fig. 73 *a–p* ; and 1932, p. 209.

Occurrence :

St. 45, South Arabian Coast, 38 m. (2).

Distribution.—Atlantic, Indian Ocean, Pacific.

Sabellaria spinulosa Leuckart var. *alcocki* Gravier.

Fauvel, 1927, p. 211 ; and 1932 , p. 209.
Sabellaria alcocki Gravier, 1909, p. 298, pl. viii, figs. 11–23.

Occurrence :

St. 27, Gulf of Aden, 37–91 m. (1).

Distribution.—Atlantic, Indian Ocean, Persian Gulf.

Remarks.—A single specimen measuring 9 mm. by 1 mm. without the tail. I am not quite satisfied as to its identity. The long erect middle paleæ (Text-fig. 27) are apparently smooth, and have much less basal excavation than that figured by Gravier. They are more like those figured by Augener (1918, pl. vii, figs. 187–190) for his *S. eupomatoides*. On the other hand, the inner paleæ are more slender and elongate than in Augener's figure (*loc. cit.*, fig. 190), and resemble that given by Gravier for his *alcocki*.

Text-fig. 27.—*Sabellaria spinulosa* Leuckart var. *alcocki* Gravier. Middle palea.

Family Ampharetidæ.

Genus *Amphicteis* Grube.

Amphicteis gunneri Sars.

Fauvel, 1927, p. 231, fig. 80 *a–k* ; and 1932, p. 216.

Occurrence :

St. 178, Gulf of Aden, 91 m. (1).

Distribution.—Atlantic, Mediterranean, Indian Ocean, Japan.

Remarks.—A single specimen in poor condition. With Fauvel I am unable to distinguish the tropical from the northern form.

Family Terebellidæ.

Genus *Thelepus* Leuckart.

Thelepus comatus (Grube).

Hessle, 1917, p. 216, pl. iii, figs. 5–7, text-fig. 62.

Occurrence :

St. 45, South Arabian Coast, 38 m. (1).

Distribution.—Chile, Panama, Arabian Coast.

Remarks.—The specimen is in very poor condition. The posterior end is missing and it has about 29 chætigers, of which the first 26 carry bristles. In the hinder segments the hooks are arranged in loops exactly as figured by Hessle. The presence of eye-spots is queried by Hessle. In this specimen they are numerous and conspicuous.

Genus *Nicolea* Malmgren.

Nicolea gracilibranchis (Grube).

Fauvel, 1932, p. 225, with citations.

Occurrence :

St. 45, South Arabian Coast, 38 m. (1).

Distribution.—Philippines, Indian Ocean, Arabian Coast.

Remarks.—A single macerated specimen with very long, sparsely branched branchiæ.

Genus *Polymnia* Malmgren.

Polymnia nebulosa (Montagu).

Fauvel, 1927, p. 257, fig. 89 *a–g* ; and 1932, p. 224.

Occurrence :

St. 27, Gulf of Aden, 37–91 m. (1).

St. 53, South Arabian Coast, 13·5 m. (1).

Distribution.—Atlantic, Mediterranean, Indian Ocean, Pacific.

Remarks.—These specimens are in fairly good condition, and with Fauvel I do not find the tropical form separable from the European species.

Genus *Loimia* Malmgren.

Loimia medusa Savigny.

Fauvel, 1932, p. 224, with citations.

Occurrence :

St. M.B. Ib, Red Sea, 26 m. (1).

St. 45, South Arabian Coast, 38 m. (1).

St. 53, South Arabian Coast, 13·5 m. (1).

Distribution.—Atlantic, Indian Ocean, Pacific.

Genus *Pista* Malmgren.

Pista herpini Fauvel.

Fauvel, 1930, p. 57, fig. 16, *a–h* ; and 1932, p. 230.

Occurrence :

St. 45, South Arabian Coast, 38 m. (1).

Distribution.—Gulf of Manaar, Persian Gulf, Arabian Coast.

Remarks.—This is a very small specimen, measuring only 7 mm. in length by 1 mm. at the widest part. The branchiæ have a rather long, simple stalk and a densely branched apex. The specimen appears to be a young example of this species.

Pista typha (Grube).

Fauvel, 1932, p. 226, fig. 36 *a–c*, with citations.

Occurrence :

St. M.B. Id, Red Sea, 26 m. (1).

St. 206, Red Sea, 256 m. (1).

Distribution.—Philippines, Indian Ocean, Japan, Australia.

Remarks.—In this species the gills with the whorled tufts are easily recognizable. As Fauvel has pointed out, it seems very close to the European *P. cristata* Müller.

Pista robustiseta Caullery.

Fauvel, 1932, p. 227, fig. 37 *a–e*.

Occurrence :

St. 45, South Arabian Coast, 38 m. (1).

Distribution.—Malay, Gulf of Oman, Japan, Arabian Coast.

Remarks.—A single damaged specimen, which as far as it goes corresponds closely to the accounts of this species.

Family Sabellidæ.

Genus *Demonax* Kinberg (*char. emend.* Johansson).

Demonax leucaspis Kinberg.

Monro, 1933a, p. 1075, with synonymy.

Occurrence :

St. 45, South Arabian Coast, 38 m. (1).

Distribution.—Callao, Valparaiso, Honolulu, Japan, California, Panama, Arabian Coast.

Remarks.—A single specimen in poor condition. I have compared it with some examples from Balboa attributed by me to this species and I find them conspecific.

Genus *Dasychone* Sars.

Dasychone cingulata Grube.

Fauvel, 1932, p. 236, with citations.

Occurrence :

St. 53, South Arabian Coast, 13·5 m. (5).

Distribution.—Red Sea, Persian Gulf, Indian Ocean, Pacific.

Remarks.—The diffuse dark spots over the body are very characteristic of this species.

Genus *Branchiomma* Kölliker.

Branchiomma mushaensis Gravier.

Gravier, 1908, p. 94, pl. vii, figs. 267–270, and text-figs. 447–453.
Monro, 1933a, p. 1078, with synonymy.

Occurrence :

St. 53, South Arabian Coast, 13·5 m. (1).

Distribution.—Red Sea, California, Galapagos, Arabian coast.

Remarks.—The gills have broad, purplish-brown bands extending on to the rachises.

Genus *Euratella* Chamberlin.

Euratella punctiirata (Augener).

Demonax puncturatus Augener, 1918, p. 576, pl. vi, figs. 170, 171, text-fig. 102.
Euratella punctiirata Monro, 1930, p. 203.

Occurrence :

St. M.B. IIc, South Arabian Coast, 29 m. (2).

Distribution.—West Africa, Annobón, Ascension Island, Arabian coast.

Remarks.—I have compared these specimens with the examples from Ascension Island attributed by me to this species, and except that they have 7 instead of 5 thoracic chætigers they agree closely. The material does not permit me to add anything to the previous accounts.

Family Serpulidæ.

Genus *Serpula* L.

Serpula vermicularis L.

Fauvel, 1927, p. 351, fig. 120 *a–q* ; and 1932, p. 241.

Occurrence :

St. 45, South Arabian Coast, 38 m. (4).

St. 53, South Arabian Coast, 13·5 m. (2).

Distribution.—Atlantic, Mediterranean, Indian Ocean, Pacific.

Genus *Hydroides* Gunnerus.

Hydroides exaltata (Marenzeller) var. *vesiculosa* Fauvel.

Fauvel, 1923a, p. 137, fig. 7.

Occurrence :

St. 112, Zanzibar, 113 m. (2).

Distribution.—Gambier Islands, Zanzibar.

Remarks.—Two small specimens with opercula corresponding closely to that described by Fauvel. A large hollow vesicle takes the place of the great unpaired hook exactly as described by him. There is, however, one small point of difference. In the present specimens there appears to be a tendency towards the development of rudimentary lateral processes at the tips of the teeth of both cups, the upper and the lower—a tendency not apparent in Fauvel's specimen. I believe the only other record of this variety to be from the Gambier Islands.

Hydroides homoceros Pixell.

Pixell, 1913, p. 74, pl. 8, fig. 1.

Occurrence :

St. 53, South Arabian Coast, 13·5 m. (2).

Distribution.—Maldives, Zanzibar, Arabian Coast.

Remarks.—Two small specimens with tubes. The opercula correspond exactly to Pixell's description and figure.

Genus *Spirobranchus* Blainville.

Spirobranchus giganteus Pallas.

Fauvel, 1932, p. 244, with citations.

Occurrence :

St. 45, South Arabian Coast, 38 m. (2).

St. 53, South Arabian Coast, 13·5 m. (1).

Distribution.—Atlantic, Indian Ocean, Pacific.

Remarks.—These specimens have 4 opercular horns, except one from St. 45, which has 5. The specimens from St. 45 are young, the larger measuring about 12 mm. in length.

Spirobranchus giganteus Pallas var. *arabica* var nov.

Occurrence :

St. 45, South Arabian Coast, 38 m. (6).

Distribution.—South Arabian Coast.

Remarks.—These specimens show a type of opercular variation so unusual that it merits a varietal name. The opercular calcareous plate is beset with small chitinous

Text-fig. 28.—*Spirobranchus giganteus* Pallas var. *arabica* var. nov. Operculum.

spines, which are also present on the horns (Text-fig. 28). Moreover, there is a tendency for the production of ramifying chitinous outgrowths, some growing directly from the surface of the calcareous plate and others from the distal end of the horns, so that in some cases the latter have a basal calcareous region beset with spines and a distal chitinous region. The specimens have a measurement of about 35 mm. in length by 3 mm. across the thorax and the tubes are bright pink in colour.

A similar development of horny spines on the opercular plate is found in Fauvel's *Pomatostegus polytrema* var. *indica*.

Spirobranchus maldivensis Pixell.

Pixell, 1913, p. 84, pl. 9, fig. 9.
Fauvel, 1932, p. 245.

Occurrence :

St. 53, South Arabian Coast, 13·5 m. (1).

St. 71, Gulf of Oman, 106 m. (4).

St. 72, Gulf of Oman, 73 m. (2).

Distribution.—Maldives, Burma, Arabian Coast, Gulf of Oman.

Remarks.—The specimens from St. 72 were obtained from off a Muricid shell. Of those from St. 71, one has an operculum surmounted by two distinct calcareous plates and recalls *Spirobranchus latiscapus* (Marenzeller), from which, as I have already suggested (1936, p. 192), the present species is very doubtfully separable. Another has a thick cluster of hydroids growing from its opercular plate, and a third has its operculum crowned with an empty spirorbid tube.

Genus *Vermiliopsis* Saint-Joseph.

Vermiliopsis glandigera Gravier.

Gravier, 1908, p. 121, pl. viii, figs. 290, 291, text-figs. 476–481.
Monro, 1930, p. 209, fig. 88 *a–c*.
Fauvel, 1930, p. 63.

Occurrence :

St. 43, South Arabian Coast, 83–100 m. (1).

Distribution.—West Africa, Red Sea, Panama, Arabian Coast.

Remarks.—The horny opercular cap has numerous partitions and tapers more or less to a point as in *V. infundibulum*. There are two small and rather worn fragments of tube which show about 5 longitudinal ridges, only one of which appears to be denticulated. As far as can be seen from the very scanty material the tube resembles that of *V. agglutinata* (Marenzeller).

Vermiliopsis acanthophora Augener.

Augener, 1914, p. 155, pl. l, figs. 21–24, text-fig. 19.
Fauvel, 1930, p. 63.

Occurrence :

St. 45, South Arabian Coast, 38 m. (1).

St. 66, Gulf of Oman, 609 m. (6).

St. 89, North Arabian Sea, 135–183 m. (6).

Distribution.—Australia, Gulf of Manaar, Galapagos, Gulf of Oman, Arabian Coast.

Remarks.—This appears to be a common species. The tubes show the marks of successive peristomes but are devoid of longitudinal ridges. In some specimens the horny top of the operculum is broken off, which gives them a misleading appearance.

Vermiliopsis multicristata (Philippi) ?

Fauvel, 1927, p. 365, fig. 125 *k–s*.

Occurrence :

St. 112, Zanzibar, 113 m. (1).

Distribution.—Atlantic, Mediterranean, Zanzibar ?

Remarks.—A single specimen with some fragments of tube was obtained from off a Cidarid spine. The operculum has a long, tapering, conical, much-divided cap exactly like that of *V. infundibulum*. The tubes, on the other hand, show about 5 clearly denticulated longitudinal ridges similar to those of the Mediterranean form. As far as I know, this species has never been recorded from the Indian Ocean.

Genus *Placostegus* Philippi.

Placostegus tridentatus (Fabricius).

Fauvel, 1927, p. 373, fig. 128 *h–p* ; and 1933, p. 79.

Occurrence :

St. 112, Zanzibar, 113 m. (1).

Distribution.—Atlantic, Mediterranean, Zanzibar.

Remarks.—I obtained from off a Cidarid spine a small section of semi-transparent, crystalline tube twisted upon itself and with 3 spines at the mouth. It is characteristic of the present species and contained an ill-preserved specimen, which as far as can be seen agrees with the European form. I was unable to see the girdle of eyes and the abdominal bristles, but in other respects, in the shape of the operculum, the absence of collar bristles and the form of the thoracic chætæ and hooks it shows no ground for separation. Except for a single doubtful record by Fauvel from the Gulf of Suez this species has not previously been signalled from the Indian Ocean.

Genus *Ditrupa* Berkeley.

Ditrupa arietina (O. F. Müller).

Fauvel, 1927, p. 374, fig. 128 *a–g* ; and 1932, p. 247.

Occurrence :

St. M.B. Id, Red Sea, 26 m. (1).

St. 45, South Arabian Coast, 38 m. (1).

St. 176, Gulf of Aden, 655–732 m. (numerous dry tubes).

Distribution.—Atlantic, Mediterranean, Indian Ocean.

Remarks.—The dry tubes from the deep water St. 176 show slight but discernible traces of the regular annular enlargements described by Fauvel (1932, p. 247) for his var. *monilifera*.

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